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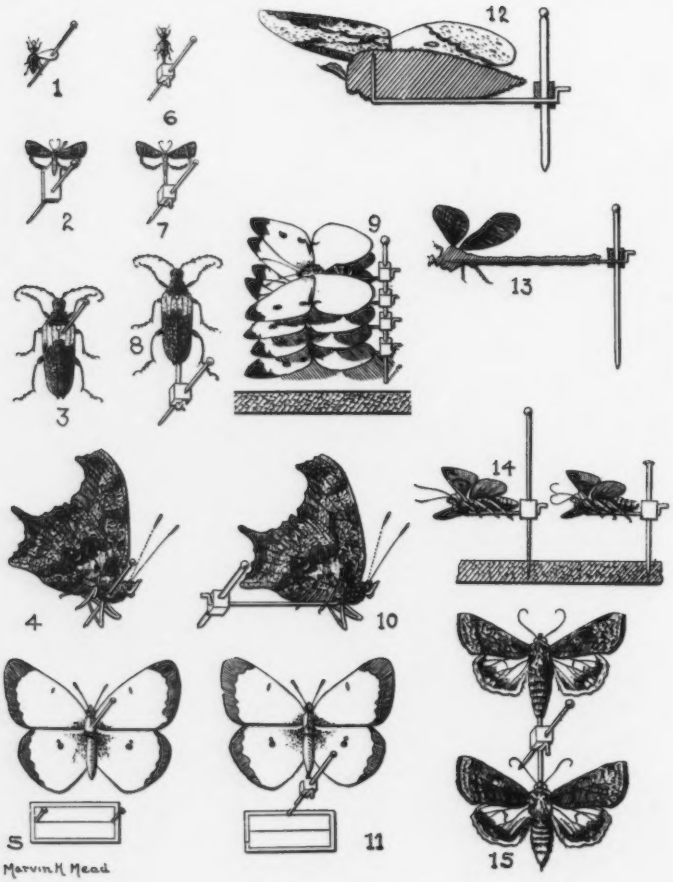

A NEW PIN—WEISS.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

VOL. XXVI. APRIL, 1915. No. 4.

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A New Pin for Mounting Insects.

By HARRY B. WEISS, New Brunswick, New Jersey.

(Plate V)

On March 17, 1914, there was issued to Mr. Marvin H. Mead, of Passaic, N. J., by the United States Patent Office, a patent covering certain improvements in mounts for specimens. These improvements should not be without interest to those engaged in entomological work requiring the care, mounting or exhibition of insects.

Briefly, the apparatus consists of a vertically supported pin bearing a small cube of cork. Through this cork runs a horizontal support having, at its distal end, a prong which is thrust into the ventral surface of the thorax. The opposite end of this horizontal support after it leaves the cork is bent to form a little crank, by means of which the specimen can be readily turned, exposing all parts of its surface for inspec-

tion. In addition this support prevents the abdomen from drooping in the process of drying (See Plate V, figures 12 and 13).

The accompanying plate V illustrates the advantages to be derived from utilizing a mount of this kind. In addition to the specimen being rotatable about a longitudinal axis, the dorsal surface of the thorax remains intact and one has an unobstructed view of the insect. The specimen can also be raised or lowered on the vertical pin, thereby eliminating one of the great disadvantages of exchanging mounted specimens (See figure 14). Another advantage is that a number of specimens can be mounted on a single main support in the area ordinarily occupied by one specimen. In this manner, several thousand specimens can be made accessible in the area usually required by several hundred. This is of considerable advantage in shipping or moving collections or storing mounted duplicates (See figure 9).

Long-bodied insects are mounted as shown in figure 13, the horizontal shaft acting as a support and replacing such supports as silver wires and bristles. Pairs can be mounted in tandem or side by side on a single main support, thereby facilitating comparison (See figure 15).

Extra label pins are not required when this new pin is used, inasmuch as the vertical pin can carry a label that will not be obscured by the insect (See figure 11). In moving specimens from one case to another both label and insect are carried in one operation. Lepidoptera are spread in the usual way and the inventor claims that it requires no additional time to mount insects on this pin after one has been shown the simple method of using it. It is readily adaptable for all sizes of insects and certainly deserves more than passing attention from entomologists. Figures 1 to 5 show the old methods of pinning and figures 6 to 15 the improved methods.

[An exhibit of insects mounted on these new pins was shown in connection with the annual meeting of the Entomological Society of America at Philadelphia in the closing days of last December. As the method aroused our interest and as only a brief account of Mr. Mead's pin has been published (Journ. N. Y. Ent. Soc. xxii, 76), we requested Mr. Weiss to describe it. We are informed that the pins can be obtained from Mr. Mead at 382 River Drive, Passaic Park, New Jersey. —Ed.]

A New Parasite of the Chinch Bug Egg (Hym.).

By James W. McColloch, Assistant Entomologist, and H. Yuasa, Student Assistant, Kansas State Agricultural College and Experiment Station.

During the summer of 1914, the Department of Entomology of the Kansas State Agricultural College carried on an extensive investigation of the life history of the chinch bug egg parasite (*Eumicrosoma benefica* Gahan). In the course of this work between seventy-five thousand and one hundred thousand chinch bug eggs were collected in the field to determine the percentage of parasitism and for use in the life history work. These eggs were collected regularly during the entire summer and were separated into lots of from ten to fifty and kept in small vials where they were examined daily. On August 4th a small, light greenish, parasite was found in a vial of eggs collected July 27th from crab grass. A careful examination of the eggs in the vial showed that one of them had a small round hole cut in the side of it. This was entirely different from the emergence holes cut by either the chinch bug or *Eumicrosoma benefica* and left no question as to where this parasite had come from. (Fig 1.) The egg from which it emerged was attached to another chinch bug egg from which an *Eumicrosoma benefica* emerged. (Fig. 2.) On August 10th another one of these parasites was bred from a chinch bug egg collected from crab grass on August 1st. This collection was made from a different field than the one of July 27th.

One of the projects under the life history work on *Eumicrosoma benefica* was to determine whether it had any host other than the chinch bug egg. Collections were made of all kinds of eggs found in the habitat of the chinch bug and its parasites. In these collections large numbers of eggs, which were thought to be eggs of a leaf-hopper, were taken and in nearly every case they were parasitized by this same greenish parasite. The exit hole in these eggs was the same as that in the chinch bug egg. (Fig. 3.)

A few specimens of this parasite were sent to Mr. A. B. Gahan, entomological assistant, United States Bureau of Entomology, and he determined them to be *Abella subflava* Girault. In commenting on his determination Mr. Ga-

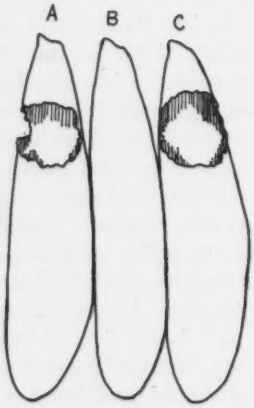


FIG. 1. FIG. 2. FIG. 3.

Fig. 1.—Chinch bug egg showing exit hole of *Eumicrosoma benefica*. Greatly enlarged.
Fig. 2.—Two chinch bug eggs deposited together. (A) shows exit hole of *Abella subflava*. (B) shows an adult *Eumicrosoma benefica* emerging from egg. Greatly enlarged.
Fig. 3.—Eggs from which *Abella subflava* were bred in large numbers. Probably eggs of a leaf-hopper. (A and C) show the exit holes of *A. subflava*. Greatly enlarged.

han says, "According to Girault this species occurs widely distributed in the United States and also in Australia. He says that it is parasitic on the eggs of a Jassid that infests wheat straw. Your specimens agree nicely in the generic characters with the types of Girault's species and I was unable to find any character that would indicate a different species although your specimens appear a little lighter in color. I attribute this to their having been in alcohol. I showed the specimens to Mr. J. C. Crawford and he agrees with me in the determination."

A number of attempts have been made to carry the life history of this parasite through on chinch bug eggs but in all cases the results have been negative. In two cases there was

some indication of parasitism but the eggs failed to give up any parasites. When placed in the presence of chinch bug eggs the females show but slight interest in the eggs and do not become excited when they come in contact with them. The length of the adult life has been found to range from seven to fourteen days when fed on sweetened water.

As a factor in the natural control of the chinch bug, *Abella subflava* plays a very insignificant part. The fact that only two parasites have been reared from the large number of eggs examined seems to indicate that parasitism of chinch bug eggs by it is accidental rather than natural.

Preliminary List of New Jersey Acarina.

By HARRY B. WEISS, New Brunswick, N. J.

The arrangement of the following list is in accordance with Banks' Catalog of the Acarina or Mites of the United States, Proc. U. S. Nat. Mus. 1907, Vol. 32. The list is of course very incomplete, but it is hoped by collections to add further to our knowledge of the Acarian fauna of the state. My thanks are due Mr. Nathan Banks for determinations made in this group.

Family TETRANYCHIDAE.

Bryobia Koch.

B. pratensis Garman. Greenloch, Moorestown, Englishtown and other parts of the state. The Clover Mite. Feeds on clover and foliage of fruit trees.

Tetranychus Dufour.

T. bicolor Bks. Westfield, 7-22-14, and other parts of state. Taken on apple, silver maple and other plants.

T. bimaculatus Harvey. Throughout the state. The common "red spider" of greenhouses. Attacks roses, carnations, palms, violets and many other plants grown under glass. Quite a pest some seasons on various outdoor plants.

T. pilosus. Newark, on fruit trees. E. L. Dickerson.

Family TROMBIDIIDAE.

Microtrombidium Haller.

M. locustarum Walsh. Occurs upon eggs, nymphs and adults of grasshoppers.

Family IXODIDAE.

Ixodes Latreille.

I. cookei Pack. New Jersey, (Tech. Series No. 15, U. S. Bur. Ent.) Common on small mammals.

Haemaphysalis Koch.

H. chordeilis Pack. The bird tick. Undoubtedly occurs in New Jersey.

H. leporis-palustris Pack. Occurs on rabbits.

Amblyomma Koch.

A. americanum Linn. Undoubtedly occurs in New Jersey. The Lone Star Tick. Has a wide range of hosts.

Dermacentor Koch.

D. variabilis Say. Milltown, Glassboro, Bridgeton, southern New Jersey. The dog or wood tick.

Family GAMASIDAE.

Dermanyssus Duges.

D. gallinae Redi. New Brunswick, Hammonton, Vineland, Bridgeton and other parts of the state. The chicken mite.

Celaenopsis Berlese.

C. latus Bks. Anglesea.

Laelaps Koch.

L. multispinosus Bks. New Jersey. On muskrat. May.

Macrocheles Latreille.

M. badius Koch. College farm, May 19, 1914. Taken on *Scatophaga stercoraria* Linn. C. H. Richardson. Also common in manure.

M. marginatus Herm. Nutley, 7-22-14. On *Allorhina nitida*. H. B. W.

Family ORIBATIDAE.

Nothrus Koch.

N. truncatus Bks. Anglesea.

Family TARSONEMIDAE.

Tarsonemus Canestrini.

T. pallidus Bks. Hoboken. On chrysanthemums in greenhouse. J. B. Smith.

T. waitei Bks. Undoubtedly occurs in New Jersey. The peach bud mite. Attacks terminal buds or shoots, usually on nursery trees.

Pediculoides Targioni-Tozzetti.

P. ventricosus Newport. New Brunswick, southern New Jersey. Attacks larvae of Angoumois grain moth and *Bruchus quadrimaculatus*. Also man causing a skin eruption.

Pediculopsis

P. graminum Reuter. Manasquan, Bergenfield, College Farm, in greenhouses. In connection with bud-rot of carnations. H. B. Weiss.

Family TYROGLYPHIDAE.

Tyroglyphus Latreille.

T. farinae De Geer. Infests flour and stored foods.

T. lintneri Osb. Orange, Trenton, Freehold. The mushroom mite. Sometimes destructive.

Rhizoglyphus Claparede.

R. phylloxerae Riley. New Jersey. In asparagus shoots.

Family SARCOPTIDAE.

Cnemidocoptes Furstenberg.

C. gallinae Railliet. Vineland, Glassboro. The "depluming mite," burrows near base of feathers.

C. mutans Robin. The "itch mite" of chickens. Attacks legs, comb and neck. Responsible for the so-called "scaly leg." Vineland, Bridgeton.

Family ERIOPHYIDAE.

Eriophyes Siebold.

E. abnormis Garman. Forms pouch-like gall on upper side of leaf of *Tilia americana*. Occurs in New Jersey. M. T. Cook.

E. crumena Riley. Small tapering gall on upper side of leaves of *A. saccharum*. Different parts of New Jersey. M. T. Cook.

E. aenigma Walsh. Somerville, Keansburg and other parts of state. H. B. W. Occurs on willows in early summer. Irregular woolly tangles of leaf or flower buds.

E. amelanchieri Steb. Elizabeth. On *Amelanchier canadensis*. The june-berry mite gall.

E. avellanae Jarvis. Norwood, Westwood. H. B. W. The hazelnut bud-gall.

E. betulae Steb. Hillsdale, Woodcliff Lake. Bud gall on yellow birch.

E. caulis Walsh. Galls occur on petiole, ribs and large veins of black walnut. Occurs in New Jersey. M. T. Cook.

E. dentatae Steb. Mount Holly. H. B. W. On *Castanea dentata*.

E. pyri Pgst. Throughout the state, on pear and sometimes apple, forming reddish blisters on leaves. Sometimes destructive. The pear leaf blister mite.

E. quadripedes Shimer. Westfield, Imlaystown, Englewood and other parts of state. Pouch-like galls on upper sides of leaves of silver maple.

E. querci Garman. In various parts of the state. The oak mite gall. Occurs on scrub oak, white oak, chestnut oak.

E. rhois Steb. New Brunswick, Highland Park, Nutley, Englishtown and other parts of state. On upper and lower surfaces of *Rhus radicans.* Poison ivy mite gall.

E. salicicola Garman. New Brunswick, Somerville and other parts of state. Galls on upper surface of willow leaves.

E. semen Walsh. New Brunswick, other parts of state. Galls on upper and lower surfaces of willow leaves.

E. serotinae Beut. Highland Park, M. T. Cook. Common gall on wild cherry.

E. ulmi Garman. Elizabeth, Westfield. Galls on upper surface of leaves of *Ulmus americana.*

E. viburni Steb. Elizabeth. Galls on leaves of *Viburnum dentatum.*

E. ferruginea Farlow. Beech mite-gall. On *Fagus americana.* New Brunswick. T. J. Headlee.

E. phlocopotes. Forms galls on plum. Trenton, October 15, 1913. New Jersey Experiment Station Report, 1913.

A New Genus of Canestriniidae (Acari.).

By NATHAN BANKS, East Falls Church, Virginia.

Dr. Roland Thaxter has recently sent me what is to me the most remarkable mite. It will form a new genus in the Canestriniidae; mites that are usually found on beetles; they are genuine parasites, but do little harm to their hosts.

Acrotocarus n. gen.

A canestriniid; body in front with a T-shaped process, the front part of which bears a large, bilobed, hyaline membrane. Legs short, coxæ radiately arranged; mouth parts sunken within an oral cavity under the anterior edge of the body.

Type—The following new species.

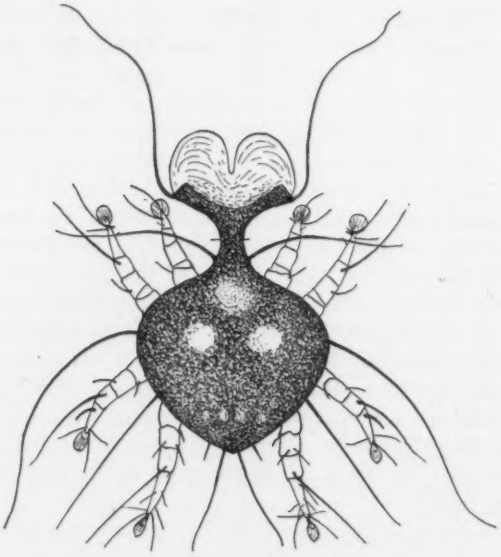
Acrotocarus mirabilis n. sp.

Body dark, legs pale, dorsum with two large pale spots in the middle and a fainter one in front of them, near tip four small pale spots form a transverse row. Main part of body about as long as broad, pointed behind.

Legs short, fourth pair about as long as width of body, penultimate joints of all, except first pair, with a very long bristle, other joints with one or two short bristles and several at tip of tarsus, caroncles of hind legs smaller than of anterior legs.

Body with four long bristles each side; one in front, one (the longest) at humerus, one on posterior middle and one near tip; at each end of the anterior process is a bristle as long as the humeral one.

Length 5 mm.



Acrotocarus mirabilis n. gen. et sp.

From Cordoba, Mexico (Mann coll.). in bottle with Chrysomelids. Type in the author's collection.

Catocala luciana from Minneapolis (Lep.)

In the fall of 1913 I had the good fortune to take a number of specimens of *Catocala luciana* H. Edw. and its subform *somnus* Dodge. All the specimens were taken while at rest on the several bridges spanning Minnehaha Creek at Minneapolis. In 1914 but very few specimens were taken, as they appeared in very small numbers.

The species seem to be of a very local distribution here, being confined to an area bordering the creek of about half a mile long and about 200 feet wide. At least no specimens have been either seen or taken outside of this area as far as I know. The nearest locality from which the species has been reported is Nevada, Iowa (Berry). How the species happened to become established here along beautiful Minnehaha Creek is difficult to understand.—JOHN W. FRANZEN, Minneapolis, Minn.

Duration of Pupal and Adult Stages of the Meal Worm, Tenebrio obscurus Linn. (Coleop.).

By PHIL RAU, St. Louis, Missouri.

About September 15, 1913, a lot of the yellow meal-worm larvae, *Tenebrio molitor* Linn., were found in a chicken-house in eastern Kansas. They were under a board among dry hen excrement and a multitude of their own shed skins. On May 10 and 15 two of them transformed into pupae. As no others pupated, I concluded the rubbish in which they were kept was too dry, so I moistened it slightly. This caused a growth of fungus which killed all the larvae.

In October of the same year I found in my own pigeon-house in St. Louis a lot of larvae of the dark meal-worm, *Tenebrio obscurus,* and made notes on the longevity of the adults and the length of time each spent in the pupal stage.

It is interesting to note that while the two lots were side by side in the laboratory, heated during the day in the winter, the dark meal-worms commenced to pupate at the end of February and the yellow ones, excepting the two mentioned heretofore, showed no signs of pupating up to the time of their death in June.*

At the end of May a search in the pigeon-house revealed a number of larvae and adults, commingled with shed skins and some dead adults. Several of the larvae were taken for controls. Here we have larvae which spent all of their lives in the open, in contrast with those fed in the laboratory. Eleven of these pupated in June and are added to the table, denoted by "s."

Table 1 gives the data of the duration of the pupal and adult life and the total for the dark meal-worm, *T. obscurus.*

It is interesting to note that all of these controls ("s" in table 1), lived shorter periods as adults and spent shorter periods as pupae. However, I do not consider that this necessarily indicates that the outdoor conditions of existence

*That these beetle adults appear considerably earlier than do the yellow ones confirms the observation of F. H. Chittenden in Bull. U. S. Dept. Agr. Div. Ent. N. S. No. 4, rev. ed., p. 118.

TABLE 1.

Date of Pupation.	Duration of Pupal Stage.	Duration of Adult Stage.	Total Days.
2-28	14	31	45
2-28	19	31	50
2-28	21	37	58
2-28	15	43	58
2-28	21	50	71
3- 1	14	55	69
3- 1	23	27	50
3- 2	18	36	54
3- 2	21	33	54
3- 7	18	29	47
3-10	17	31	48
3-11	18	?	?
3-14	16	28	44
3-15	15	28	43
3-17	16	?	?
3-19	22	?	?
3-20	17	27	44
3-20	17	27	44
3-22	19	35	54
3-23	18	15	33
3-23	18	?	?
3-24	17	35	52
3-24	19	25	44
3-24	19	25	44
3-24	19	27	46
3-25	20	13	33
3-26	13	24	37
3-28	20	38	58
3-28	20	36	56
3-29	21	34	55
3-30	23	23	46
3-30	24	?	?
4- 1	21	20	41
4- 2	21	28	49
4- 6	18	23	41
4- 7	17	13	30
4- 7	17	27	44
4-12	14	27	41
4-24	13	21	34
5- 3	14	10	24
5- 3	14	11	25
5-12	11	16	27
5-15	11	11	22
5-31 ♂	5	12	17
6- 3 ♂	6	12	18
6- 6 ♂	7	11	18
6- 6 ♂	5	12	17
6- 6 ♂	7	12	19
6- 6 ♂	5	12	17
6- 6 ♂	5	12	17
6- 6 ♂	5	11	16
6- 6 ♂	5	12	17
6- 9 ♂	4	11	15
6-11 ♂	6	?	

are more favorable than the laboratory conditions, but rather that the prolongation of life results from inertia. We find in the cecropia moth* that colder condition is correlated with longer life, while warmer surroundings increase activity and cause earlier exhaustion. Here, too, we will find by glancing at the table that some of those which pupated in March enjoyed the longest combined period of pupal and adult life, and each succeeding month, as the weather grew warmer, brought a shorter duration until June brought the shortest life of all.

One might expect to find that the length of pupal life would in some way affect the adult life, either that a long pupal life would endow the individual with abundant vigor to carry it through a longer adulthood, or else that the combined length of life of pupa and adult was somehow allotted by nature and that when the pupal stage was extended the adult life would be correspondingly abbreviated, and *vice versa,* so the balance

*Journ. Exp. Zool., Vol. XII, p. 189, 1912.

would be maintained. But a scrutiny of these data reveals no evidence of such a result. In two cases the duration of the stages was equal, in six cases the pupal duration was greater than the adult duration, and in forty-one the adult life was the greater. In some cases we find a long pupal stage correlated with a long adult stage; in others we find a shorter pupal stage correlated with a still longer adult stage, etc., in almost every possible combination. The following tables show the details of the duration of the pupal stage, the adult stage and the combined durations.

TABLE 2.

Duration of Pupal Stage.	
Days.	Frequency.
4 s	1
5 s	6
6 s	2
7 s	2
11	2
13	2
14	5
15	2
16	2
17	6
18	6
19	5
20	3
21	6
22	1
23	2
24	1

Av. 15 Ds.

TABLE 3.

Duration of Adult Stage.	
Days.	Frequency.
10	1
11 s	5
12 s	7
13	2
15	1
16	1
20	1
21	1
23	2
24	1
25	2
27	6
28	3
29	1
31	3
33	1
34	1
35	2
36	2
37	1
38	1
43	1
50	1
55	1

Av. 24 Ds.

TABLE 4.

Combined Pupa & Adult.	
Days.	Frequency.
15 s	1
16 s	1
17 s	5
18 s	2
19 s	1
22	1
24	1
25	1
27	1
30	1
33	2
34	1
37	1
41	3
43	1
44	6
45	1
46	2
47	1
48	1
49	1
50	2
52	1
54	3
55	1
56	1
58	3
69	1
71	1

Av. 39 Ds.

The duration of the pupal life of 54 individuals (see table 2) varied from 4 to 24 days, with an average of 15 days; 48 of these (table 3) passed through a normal adulthood of 10 to 55 days, with an average of 24 days, and the combined duration for these 48 individuals (table 4) gives a total life of 15 to 71 days, or 39 on an average. The tables are for both sexes; no attempt was made to distinguish the sexes.

Food. The food of both larvae and adults consists of feathers (the barbs), barley, oatmeal, sunflower seeds, seeds found in bird excrement, rice, dead crickets and dead larvae of their own species.

Exceptionally long duration of larval stage.—The species is generally annual in its development, but not without exception. The eggs are deposited in early summer; in August the larvae are full-grown, but go on feeding until about March, when they usually pupate, but some go on longer. In the material of *T. obscurus* taken full grown in October, 1913, I have three still feeding in the grown larval state now, November 16, 1914, and they seem to be healthy, and in good condition, while their sisters have done their share in propagating the race and died long ago.

Color. The color of the larva of *T. obscurus* is dark brown, while the entire pupa is cream white and remains so until about to transform into an adult; then first of all the legs and antennae assume a reddish brown color, then the head and finally the entire body. The adults at transformation are also of this brownish color, but gradually become darker until after a few days they are of a dull, piceous black color.

Three new Species of Japanese Orl Flies (Neur., Megal.).

By WARO NAKAHARA, Tokyo, Japan.

Amongst recent additions to my collection from different parts of Japan are the following three species of *Sialis* which are evidently undescribed. Although as ordinary-looking as the others, they possess anal appendages very different from those of any other known species.

Sialis diminuta n. sp. (Text-fig. 1).

Head black with about ten obscure brownish longitudinal streaks, of which the median two are very distinct, on caudal half; maxillary palpus ochraceous brown, excepting the basal joint which is black; labial palpus totally blackish; antennae black.

Prothorax evidently wider than the head, rounded on the anterior

angles and somewhat concave on the middle of the posterior margin; the rest of thorax totally blackish.

Legs all black, with fine hairs on coxae and femora; the first tarsal joint nearly as long as the second and third together in each leg; claws blackish.

Fore wing rather smoky, suffused with ferruginous in the basal portion and at pterostigma; veins stout and black, basal portion of the upper branch of media and the inner cross-vein between radial sector and media nearly colorless; about ten cross-veins in costal area; three or four veins in pterostigmatic region; one cross-vein between subcosta and radius. Hind wing much paler than the fore wing, especially so in anal area; pterostigmatic region darkish, containing two or three veinlets; some five or six cross-veins in costal area.

Abdomen dark piceous; the ninth segment moderately long; the tenth segment very short. Ventral appendages of the male long, narrow, and rounded at apex, wide apart from each other.

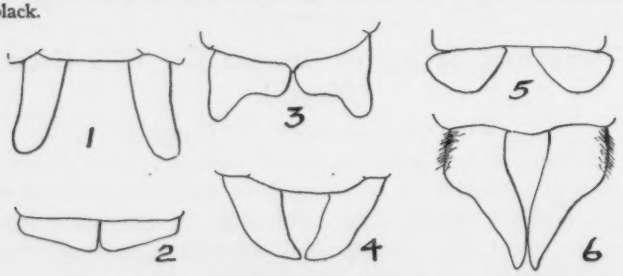
Length of body 8 mm., of fore wing 9 mm., of hind wing 7.5 mm.

A single male specimen, captured by me at Seta, near Tokyo, in April, 1914, is in my collection.

Sialis melania n. sp. (Text-fig. 2).

Head black with many impressed longitudinal lines on the caudal half; maxillary palpus black; labial palpus fuscous black; antenna black, shorter than fore wing.

Prothorax wider than broad, rather rounded on anterior angles, and somewhat concave on posterior margin; meso- and metathorax entirely black.



Ventral abdominal appendages of males of Japanese species of *Sialis*.
1.—*Sialis diminuta* n. sp. 2.—*S. melania* n. sp. 3.—*S. nikkoensis* n. sp.
4.—*S. japonica* v. d. Weele. 5.—*S. mitsuhashii* Okamoto. 6.—*S. frequens* Matsumura.

Legs deep black, the first tarsal joint shorter than the next two following joints together in fore and middle legs, but in hind leg these two parts are of nearly the same length.

Fore wing nearly black, somewhat paler in the discal area; basal

portion deeply blackish along subcosta, radius, media, lower cubitus and upper anal vein; membrane with a great many minute black spots. Venation black, excepting median fuscous portion of media; costal area blackish at basal half, gradually becoming paler toward middle, with about ten cross-veins; pterostigmatic region blackish, with one, two, or rarely three, fuscous veinlets. Hind wing paler, nearly colorless in anal area, but blackish in apical and hind marginal areas; pterostigmatic region tinged with fuscous. Venation mostly blackish, but radius, media and cubitus are yellowish at bases, and anal veins almost entirely yellowish; a blackish streak along the upper cubitus and first anal vein.

Abdomen black, somewhat brownish on ventral side. In the male, the ninth abdominal segment rather long, the tenth much shorter; ventral appendages are nearly equilaterally triangular in outline, and are very close together.

Length of body, 11 mm.; of fore wing, 11 mm.; of hind wing, 10 mm.

Two specimens (♂ ♀), captured by Mr. T. Esaki, at Minomo, near Osaka, in May, 1914, are in my collection.

Sialis nikkoensis n. sp. (Text-fig. 3).

Head blackish, a little narrower than prothorax, not narrowed posteriorly, beset with blackish hairs on the sides; caudal half of head with ferruginous streaks and spots; maxillary and labial palpi fuscous; antenna black.

Prothorax black, rather rounded on the anterior angles; meso- and metathorax nearly as large as prothorax, and totally blackish.

Legs black, coxae and femora of all the legs covered with short brownish hairs; the first tarsal joint as long as the next two following joints together in each leg; claws very small, piceous.

Fore wing slightly tinged with grayish; marginal area somewhat brownish; basal portion deeply variegated with piceous black, especially deeply along veins; pterostigma rather piceous. Venation black, basal portion of upper branch of media pale; 11-14 cross-veins in discal area; two very weak cross-veins in pterostigma; a single cross-vein between subcosta and radius. Hind wing slightly tinged with grayish throughout; pterostigma and apical area of the wing more or less suffused with brownish; venation mostly blackish or piceous; narrowly piceous along upper cubitus; 6-8 cross-veins in costal area.

Abdomen fuscous gray; the ninth ventral segment very short; the tenth segment short, yellowish and minutely spotted with piceous. Paired ventral appendages very large, nearly deltoid in shape when seen from below.

Length of body, ♂ 15, ♀ 17 mm.; of fore wing, ♂ 12, ♀ 14 mm.; of hind wing, ♂ 11, ♀ 13 mm.

Three male and seven female specimens, captured by me at Yumoto, Nikko, on July 29, 1914, are in my collection.

In studying these new species I had occasion to examine rather minutely the anal parts of all the Japanese forms of which I possessed adequate material, including all the described species excepting *S. jezoensis* Okamoto, of which only a single *female* specimen (type) is known. I have given here outlines of the ventral aspects of the appendages of the new species just described, together with those of other known species, as these are of considerable value in determination of the species.

Life History of Menesta albaciliella Chambers (Lep.).

By ANNETTE F. BRAUN, Cincinnati, Ohio.

Strobisia albaciliaeella Cham., Can. Ent., X, 77, 1878;
Menesta albaciliaeella Busck, Proc. U. S. N. M., XXV, 903, 1903;
Dyar, List N. A. Lep., No. 5652, 1902.

The fact that the imagos of this species are always found in open woods or fields amongst patches of blackberries, and usually resting on the upper side of the leaves in the sun, pointed to the probability of blackberry for the food plant. A search for the larvae several weeks later resulted successfully and a number of moths were reared.

The larval habits of this species resemble in general those of the other two species of the genus, but show some interesting and peculiar variations from the habits of either.

On June 19, a number of larvae, some very young, others about half grown were secured on leaves of the common blackberry (*Rubus villosus* Ait.). The larva feeds on the under surface of the leaf, beneath a web of silk which begins in the angle between the midrib and a lateral vein and extends along the midrib and outwardly between two lateral veins. The accompanying figures will supplement the description to follow. At first the larva skeletonizes a narrow portion of leaf extending from the angle along a lateral vein, or rarely from the angle along the midrib itself (*a*). In the basal part

of this area, the upper epidermis is left intact, but there is no evidence that the larva is a miner at any stage. Farther out in the same area, holes are made but often a fragment of the upper epidermis is left. During this time the larva has been increasing the extent of its web, which however remains densest near its beginning, toward which it retreats when disturbed. Toward the outer edges of the web the larva then blocks out the area next to be consumed, thus: a narrow line leaving the upper epidermis intact is cut through the lower

Effects of feeding methods of the larva of *Menesta albaciliella*. Explanation in the text.

epidermis and leaf substance, enclosing thereby an irregular oval or circular space (*b*). In the portion of this space first consumed, a small piece of upper epidermis is left, which soon becomes brownish and shriveled. In the rest of the oval space the entire substance is eaten (*c*). The earliest if such areas are usually small; there may be three or four similar holes, each larger than the preceding (*c*). The web is extended outwardly in a thin sheet to reach each of these spots (*c*). At maturity the web is thickened near the angle and drawn into an oval cocoon-like mass, within which the characteristic short and broad flattened pupa is formed. The imagos appeared July 11-18.

There is a second generation late in the summer which produces imagos the following spring.

On Some American Aeolothripidae (Thysanoptera).

By J. Douglas Hood, U. S. Biological Survey.

Three years ago, in this journal, Dr. E. A. Back recorded *Aeolothrips vespiformis* Crawford, as rather common at Orlando, Florida. The species had been described three years before from a unique female collected in Nicaragua. For it he erected the new genus *Franklinothrips,* in honor of Dr. Henry J. Franklin. A second species of this genus is described below, from Panama. The European *Aeolothrips albicinctus* Haliday is also reported for the first time from America.

FRANKLINOTHRIPS Back.

1912. *Franklinothrips* Back, Ent. News, Vol. XXIII, p. 75.
1913. *Franklinothrips* (pars), Bagnall, Trans. 2nd Intern. Ent. Congr., pp. 396, 397.
1913. *Franklinothrips* (pars), Bagnall, Journ. Econ. Biol., Vol. 8, p. 157.

Type. Aeolothrips vespiformis Crawford, designated by Back, l. c.

This genus is very distinct from *Aeolothrips,* in which its type species was originally described, as shown by the union of the head and prothorax into a compact elliptical mass; by the short broad head, whose outline as seen from above is almost exactly semi-circular; and by the narrow fore wings, which are without cross veins, distinctly broader across scale than at basal fourth, and which have a denuded area near base and long costal bristles.

Aeolothrips longiceps Crawford, *A. nasturtii* Jones, and *Mitothrips megalops* Trybom have recently been placed in *Franklinothrips;* but the first two of these appear rather to be true members of the genus *Aeolothrips* Haliday, while the third forms the type of the genus *Mitothrips* Trybom. *Aeolothrips longiceps* is almost certainly a male of *A. kuwanaii* Moulton in which the wing veins have become obliterated by the reagents used in its mounting; and it is just possible that this explanation is the proper one for the disappearance of the cross veins in the wing of *A. nasturtii.* Both species were described from uniques.

Mitothrips megalops certainly belongs in a distinct genus, for the third and fourth antennal segments are remarkably elongated, the fourth alone being nearly three times as long as the five succeeding segments combined. Furthermore, the head is greatly enlarged and not at all continuous in outline with the prothorax, and the eyes are exceedingly large, prominent, and reniform. It is doubtless the closest known relative of *Franklinothrips;* the resemblance of the wings is especially noteworthy.

As above restricted, *Franklinothrips* contains two species which may be separated by the following:

Key to the Species of Franklinothrips.

a. Antennae less slender, the third segment about 11 times as long as greatest subapical width; segments 1-3 clear pale yellow; combined lengths of segments 5-9 about 1.3 times as great as that of segment 3; 3 about 2.5 times as long as 5. Fore wing near apex with a rather poorly defined pale spot which does not attain the ring vein. (Fla., Tex., Nicaragua, Panama.)

F. vespiformis Crawford.

aa. Antennae more slender, the third segment about 13 times as long as greatest subapical width; segments 1-4 clear pale yellow; combined lengths of segments 5-9 about equal to that of segment 3; 3 about 3.7 times as long as 5. Fore wing near apex with a large distinct white area entirely occupying the space between the two portions of the ring vein. (Panama.)

F. tenuicornis Hood.

Franklinothrips vespiformis Crawford. (Fig. b).

1909. *Aeolothrips vespiformis* Crawford, Pomona Coll. Journ. Ent., Vol. 1, p. 109, fig. 49, A-D.

1912. *Franklinothrips vespiformis,* Back, Ent. News, Vol. XXIII, p. 75, figs. 1-3.

1913. *Franklinothrips vespiformis,* Hood, Psyche, Vol. XX, p. 119.

1913. *Franklinothrips vespiformis,* Bagnall, Trans. 2nd Ent. Cong., p. 397.

Distribution: Nicaragua (Crawford); Florida (Back); Texas (Hood); Canal Zone, Panama (Hood); Moro Island, Panama (Bay of Panama, near Taboga Island), October 17, 1913, 3 females, James Zetek.

Franklinothrips tenuicornis sp. nov. (Fig. a).

Female.—Length about 1.8 mm. General color blackish brown, with purple reflections, the head darkest; pterothorax with bright orange pigment; first abdominal segment orange, with a line of brown along sides and base; second and third segments clear white in apical two-thirds, brown at base; last segment lemon yellow; antennal segments 1-4 clear pale yellow, 5-9 dark blackish brown; fore femora orange, shaded with brown on outer surface; middle and hind femora white at extreme base, yellow at apex, the intermediate portion brown, with orange pigment; tibiae brown, tarsi yellow; wings of fore pair dark brown, with three transverse white bars; the first sub-basal, narrow, irregular, not traversing the scale; the second broad, crossing middle of wing; the third subapical, not quite attaining margins.

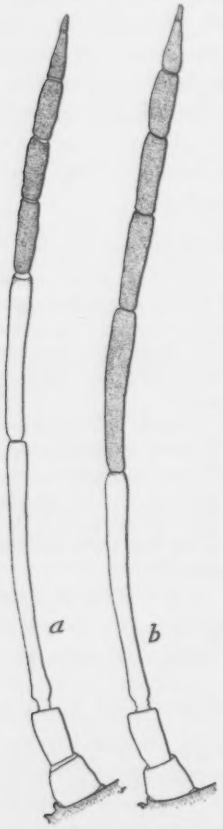


Fig. a, right antenna of *F. tenuicornis* Hood.
Fig. b, right antenna of *F. vespiformis* Crawford.

Head about two-thirds as long as wide, smooth and shining above, sloping evenly to base of antennae, the dorsal outline of cheeks, eyes and front of head almost exactly semicircular; frontal costa broadly rectangularly emarginate; a pair of rather prominent bristles between anterior and posterior ocelli, two pairs of smaller postocellar bristles, and a few still smaller bristles on cheeks and eyes; ventral surface of head flattened, densely hairy, produced anteriorly as far as the base of the first antennal segment, the apex of this production with a pair of dark bristles nearly equal in length to the two basal segments of antennae. Eyes longer than their distance from posterior margin of head, posteriorly prolonged on ventral surface, and with large, circular, separated facets. Ocelli of posterior pair twice the diameter of anterior ocellus and more widely separated. Antennae very slender, about 3.7 times as long as head; segment 3 about 13 times as long as greatest subapical width and 3.7 times as long as 5; combined lengths of 5-9 about equal to that of 3; segments 1-4 pale yellow, 4 grayish at apex; 5-9 nearly black. Maxillary palpi 3-segmented; labial palpi 4-segmented.

Prothorax slightly longer and broader than head, much broader than long, sides converging posteriorly, with a few minute bristles. Mesothorax semicircularly rounded in front. Wings of fore pair narrow, without cross veins, distinctly broader across scale than at basal fourth, and with a denuded area near base. Legs very long and slender.

Abdomen very narrow at attachment to thorax, subpetiolate, diverging to sixth segment, where it is about 1.3 times as wide as pterothorax, thence converging abruptly to tip. Bristles on segment 10 yellow, all others dark brown, arranged as in its congener.

Measurement of holotype: Length 1.76 mm.; head, length .198 mm., width .290 mm.; prothorax, length .222 mm., width .300 mm.; mesothorax, width .330 mm.; abdomen, width at segment 6, .432 mm. Antennal segments: 1, 36; 2, 48; 3, 246; 4, 156; 5, 72; 6, 60; 7, 54; 8, 43; 9, 16 microns; total length of antenna, .73 mm.; width at segment 3, .0195 mm.

Described from one female taken by Mr. James Zetek, by sweeping, Moro Island, Panama (Bay of Panama, near Taboga Island), October 17, 1913.

Closely allied to *F. vespiformis*, with which it was taken and at first confused, but easily distinguished by the characters given in the key.

Aeolothrips albicinctus Haliday.

1836. *Aeolothrips albicincta* Haliday, Ent. Mag., p. 451.
1838. *Aeolothrips albicincta*, Burmeister, Handb. d. Ent., Bd. II, p. 418.
1843. *Aeolothrips albocincta*, Amyot et Serville, Ins. Hemip., p. 646.
1852. *Aeolothrips albicincta*, Haliday, Walker, Homop. Ins. Brit. Mus., p. 1118.
1879. *Aeolothrips albicincta*, Reuter, Diagn. öfv. nya Thys. f. Finland, p. 7.
1895. *Aeolothrips albocincta*, Uzel, Monogr. Ordn. Thys., p. 75, Tab. I, Fig. 3.
1899. *Aeolothrips albicincta*, Reuter, Acta Soc. Fauna Flora Fennica, Vol. XVII, No. 2, p. 33.
1907. *Aeolothrips albocincta*, Buffa, Atti Soc. Tosc. Sci. Nat., Mem., Vol. XXIII, p. 57.
1907. *Aeolothrips albocincta*, Buffa, Processi verbali d. Soc. Tosc. Sci. Nat., adunanza del dì 7 luglio, 1907.
1908. *Aeolothrips albocinctus*, Buffa, Redia, Vol. V, p. 134.
1913. *Aeolothrips albocinctus*, Williams, Journ. Econ. Biol., Vol. 8, p. 216.

1914. *Aeolothrips albicinctus*, Karny, Verh. k. k. zool.-bot. Gesellsch. Wien, LXIV Bd., p. 51.

Five females (of which two are macropterous) and one male (brachypterous) were taken in the State of New York by Mr. J. C. Faure, when he was a student in Cornell University. They were correctly identified by Mr. Faure, and have subsequently been compared by the writer with authentic European material. The detailed records of the specimens are as follows: Canastota, New York, July 29, 1912, 3 ♀ ♀, of which one is macropterous, on corn leaves; Canastota, N. Y., Aug. 1912, 1 ♂, brachypterous, reared; Chester, N. Y., Aug. 14, 1912, 1 ♀, brachypterous, on onion; Elmira, N. Y., July 1, 1912, 1 ♀, macropterous, on onion.

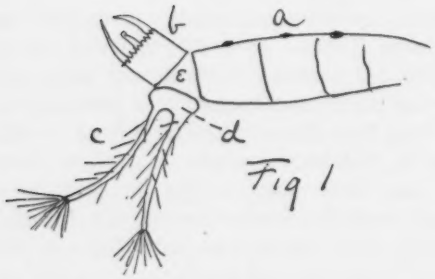
An interesting addition to the American list, which in Europe has been recorded from England, Finland, Sweden, Austria, Italy, Portugal and Sardinia.

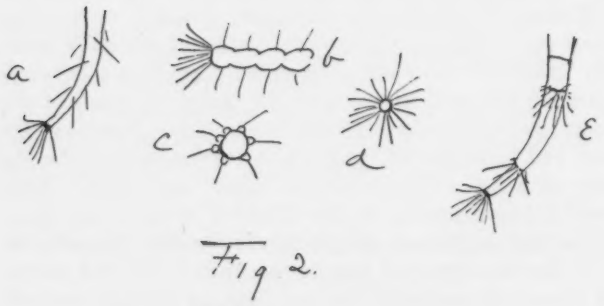
A Remarkable Abdominal Structure in Certain Moths (Lep.).

By FREDERICK W. RUSSELL, M. D., Dallas, Texas.

Many years ago while living and collecting at Winchendon in the northern part of Massachusetts, I was one day manipulating the abdomen of a certain moth for the purpose of expressing the eggs. Suddenly there shot out from the extremity of the abdomen a tubular process, curved, tapering and crowned at the end with a neat little brush of yellowish hair. It was of a pale flesh color and sparingly clothed with delicate, long, brownish hair. With the slightest variation in the pressure, or by the motion of the air, it waved to and fro in a very interesting way. I tried by maintaining the pressure for a long time to get it to harden and so be preserved as a specimen, but after a half hour's effort I desisted, when it suddenly shot back out of sight. I have always believed that the species was *Drasteria erechtea*, but I have not been able to see it in that species since, and the observation remained unique until very recently.

Driven to the South by failure of health, I have taken up my residence in Dallas, Texas. Here the nights of March 31st and April 1st, of 1913, were very dark, very warm and sultry. In the evening there was a huge halo of insects gyrating around an arc light near my house. The ground beneath was black with beetles, *Calosoma scrutator* in great numbers, *Carabus lugubris*, big black water beetles and two large species of Dytiscidae, with Lachnosternas by the handful. Now and then plump white moths whacked down on the roadway, and proved to be the well-known moth of the salt marsh caterpillar of Harris—*Estigmene acraea*, Drury—often excessively abundant in the middle states. I secured a great many specimens and made a beautiful plate of nature-prints illustrating the wide variation of the species in size and the number and proportions of the black dots. Applying my thumb and forefinger of the left hand to the sides of the abdomen of a male, I moved them slowly and firmly down toward the anal portion of the abdomen, when to my great surprise and delight, the long-sought abdominal process shot out of the last segmental line on the ventral side and waved back and forth as of old. In one specimen the anal segment lifted itself upward strongly and gave so fine a view of the affair that I seized my pencil and got a fairly good drawing of the structure, though I have no facility in that work and certainly no felicity. I have reproduced this sketch as text fig. 1, accompanying this article. As the pressure increases near the end of the body, the anal segment lifts itself upward more or less and the last suture begins to widen. To the right and left laterally, first appear in the widening aperture, the tips of two brushes of hair, when suddenly, always amusingly suddenly, there shoot out two flesh-colored, curved, tapering, tubular processes, united at the base, and with a brush of hair at the ends. The sides of the tubes are somewhat crenulated, as if segmented, although that does not seem to be really the truth, and there is a rather scanty growth of delicate, brownish hair along and around the tubes. Their constant waving gives the impression that they are alive. I verified this observation in the fall of 1913 and in April and





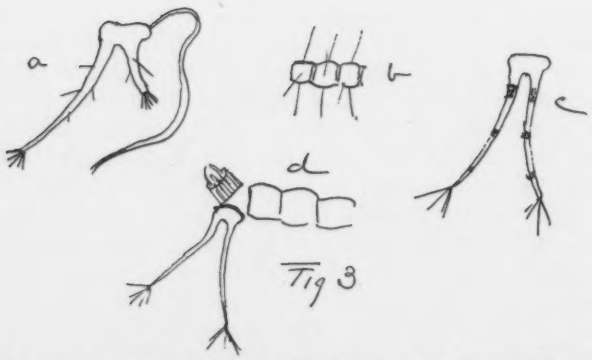


Fig. 1.—*Estigmene acraea* ♂; *a* abdomen, right side; *b* anal segment strongly thrown upwards; *c* tubular processes projecting from anal suture; *d* basal union of the two tubes; *e* anal suture widely opened.

" 2.—*Clemucha venosa*; *a* curved tube; *b* edge of tube; *c* cross section of tube; *d* circular brush at end of tube; *e* circular brushes of hair and basal thickening.

" 3.—*Scepsis fulvicollis*; *a* process extracted with thread-like attachment; *b* feeble crenulations of tube; *c* golden bands of color found occasionally around the tube; *d* the processes expressed.

September of 1914, although the species has been rare since the great flight of the spring of 1913.

In the fall of 1913 and again in May and October, 1914, there were abundant examples of the pretty moth *Ctenucha venosa*, with very black wings, with reddish stripes lengthwise of the fore wings and the edges of the shoulder-lappets also tinged with red. In the spring they were flying about the blossoms of the horsemint, near a wood of hackberry trees. In October they were resting on and flying about the yellow-blossomed broom weed which covers the fields with vast sheets of bloom. In the *venosa* I also found this strange process in the males. It seems a little stouter in proportion to the size of the insect. In May many of the examples were defective, poorly developed. Normally they are about 5/8 of an inch long, with the sides a little more crenulated, the crenulations extending around the tube, and dotted with the usual delicate hairs. In one case there was a circular fringe of hair at the base, another midway and the usual brush at the end. Sometimes there was a band of golden yellow about the base and one or two more along the tube. The brush at the end was also circular.

In the fall of 1913 I secured one male of *Scepsis fulvicollis* which had precisely the same structure, and on October 23, 1914, I got two males and one female, and during the next two weeks they were not rare. Always the males possessed this process, never the females, which makes me feel that the first Winchendon example was also a male. In *fulvicollis* the process is much longer and more delicate than in *Estigmene acraea* and in *Ctenucha venosa*. It measured in one case 1 1-16 inches. The sides of the tubes are hardly crenulated, and the terminal brush very small. In one case there was a thickening at the base, of a slightly different hue, and in this case also a circular brush of hair near the end. On one occasion I cut off the anal segment and extracted the process. Attached to the basal cross-bar was a thread-like tubular structure two inches long, which I thought might be an intestine and probably not a real factor in the case.

On November 22, 1914, a boy friend brought in a fine

fresh male of *Ctenucha cressonana*. "It is, it is, The Cat!!" It presents a fine example of the process, long, quite slender, smooth, with denser but shorter hairs along the tubes and a smaller brush at the ends.

It is not to be supposed that I have secured all the species of moths that have this peculiar structure. Yet for many years I have very regularly tested almost everything that has come in my way. I have found, however, some peculiar features in two or three butterflies. I have examined very few Geometrids. Of the four species certainly known, one is a Bombycid, and three are Syntomids, a family that contains an immense number of species in the lands to the southward.

It is to be hoped that some one familiar with histological work can investigate further. Very fresh specimens will be needed.

The sketches made to illustrate the text are diagramatic.

A new Nearctic Gonomyia (Tipulidae, Diptera).

By CHARLES P. ALEXANDER, Ithaca, N. Y.*

The crane-fly herein described as new appears to be rather widely distributed in northeastern North America, but has been confused with previously described forms.

Gonomyia (Gonomyia) mathesoni sp. n.

Color light brown, the thorax rather indistinctly striped; femora without brown bands; wings nearly hyaline; *Sc* long, extending far beyond the origin of *Rs;* cell 1*st M2* open by the atrophy of the outer deflection of vein *M*3; basal deflection of *Cu*1 far before the fork of *M*.

Male.—Length, 5-5.2 mm.; wing, 6-6.1 mm. Female.—Length, 6.6-6.8 mm.; wing, 6.3-7 mm.

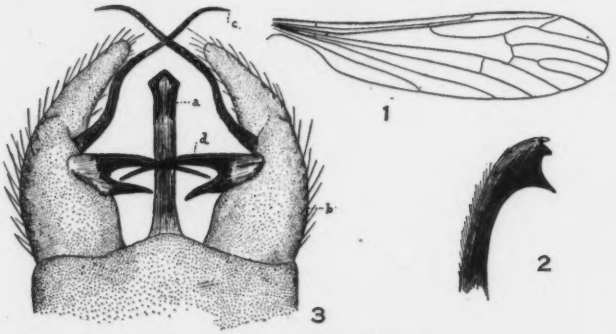
Rostrum and palpi dark brownish black. Antennae rather short, the three basal segments light yellow, the remaining segments brownish. Front white, the vertex more yellowish, the region adjoining the eyes behind more brownish.

Pronotum pale, whitish. Mesonotal praescutum light yellowish brown with indistinct darker brown stripes behind, one on either side of the rather broad median area, these extending from the transverse suture to the proximal ends of the pseudosutural foveae; lateral mar-

*Contribution from the Entomological Laboratory of Cornell University.

gins of the sclerite broadly white; in alcoholic specimens four stripes show on the praescutum, the elongated median one being subdivided by a narrow line; scutum light yellowish brown with a large rounded brown spot on each lobe; scutellum and postnotum reddish brown. Pleura pale brown and white, the brown being in the shape of a broad band extending from the cervical sclerites to the postnotum; sternites brown. Halteres rather long, pale yellowish brown.

Legs with the coxae and trochanters light yellow, remainder of the legs light yellowish brown, the tarsi a little more infuscated.



Gonomyia (*Gonomyia*) *mathesoni* n. sp.

Fig. 1.—Wing. Fig. 2.—Hypopygium, lateral aspect of the penis guard. Fig. 3.—Hypopygium, ventral aspect. *a* penis guard; *b* pleura; *c* dorsal apical appendage; *d* ventral apical appendage.

Wings hyaline or nearly so, stigma barely indicated, veins pale yellowish brown. Venation: (see text figure 1) *Sc* long, extending to about midlength of *Rs*; *Rs* elongated, arcuated; *R2* + 3 subangulated at the proximal end of the stigma; basal deflection of *R*4 + 5 usually angulated; cell 1*st M2* open by the atrophy of the outer deflection of vein *M*3; basal deflection of *Cu*1 far before the fork of *M*, this distance being longer than the deflection.

Abdominal tergites brown, narrowly and indistinctly margined on the lateral and caudal edges with dull yellow; sternites dull yellow. Male hypopygium (see text figure 3) with the ninth pleurite (*b*) enlarged at the base, at the apex produced caudad into an elongate, fleshy lobe, pale in color and provided with numerous hairs; the ventral inner face of the pleurite is provided with two appendages, the dorsal one (*c*) very long, slender, simple, twisted, pale and blackened at the tip; the ventral appendage (*d*) is bifid, the outer arm over twice as long as the short cephalic inner arm; in a position of rest both of these appendages are decussate. Penis-guard (*a*) viewed from the side (see text figure 2) elongate, bent slightly ventrad, the tip enlarged and provided on the lower surface with four teeth, the

lower pair of which are the larger. Gonapophyses small, pale, feebly chitinized, cylindrical, on the cephalic face at two-thirds the length with a feeble chitinized tooth.

Habitat.—Eastern United States and Canada.

Holotype, ♂, Sacandaga River, Fulton Co., N. Y., June 26, 1914 (Alexander).

Allotype, ♀, topotypic.

Paratypes, 30 ♂, ♀, topotypic. 10 ♂, ♀, Truro, Nova Scotia, July 7 to 26, 1913 (Matheson).

This interesting species has long been confused with *Gonomyia cognatella* O. S., but has little in common with that insect. It is more closely related to *G. blanda* O. S., but is easily separated by the unmarked wings. The cell *1st* M^2 open by the atrophy of the outer deflection of vein M^3 is found only in *cognatella, blanda* and *mathesoni* in Eastern North America. These three species may be separated as follows:

1. Basal deflection of *Cu*1 at the fork of *M; Sc* short ending just before the origin of *Rs.* *cognatella* O. S. *.
Basal deflection of *Cu*1 far before the fork of *M; Sc* long, ending beyond the origin of *Rs.* 2.
2. Wings spotted. *blanda* O. S. †.
Wings unmarked. *mathesoni* sp. n.

This species is named in honor of the collector of the paratypes from Nova Scotia, Dr. Robert Matheson, of Cornell University.

The insect, both in New York and in Nova Scotia, is found on rich vegetation along the banks of rivers. The Tipulidae found in association with this species include the following: *Antocha saxicola* O. S., *Cryptolabis paradoxa* O. S., *Rhabdomastix* (*Sacandaga*) *flava* Alex., *Gonomyia sulphurella* O. S., etc.

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* *cognatella* Osten Sacken; Proc. Acad. Nat. Sci., Phila., 1859, 230; Monographs of the Diptera of North America, IV, 1869, 181, pl. IV, fig. 18 (male genitalia); 23rd Report N. Y. State Entomologist, 1907, Needham, Crane-flies of New York, pl. 24, fig. 4 (wing).

† *blanda* Osten Sacken; Proc. Acad. Nat. Sci. Phila., 1859, 231; Monographs of the Diptera of North America, IV, 1869, 182, 183, pl. IV, fig. 17 (male genitalia); 23rd Report N. Y. State Entomologist, 1907, Needham, Crane-flies of New York, pl. 24, fig. 5 (wing).

Three Synchloes, Their Differences and Relations (Lep.).

By VICTOR DURAN and FORDYCE GRINNELL, JR.,
Los Angeles, Calif.

A casual examination of a series of *Synchloe lacinia* form *saundersii* from Argentina so impressed the authors by the similarity of this form to our *californica* (Wright) that we decided to make a somewhat detailed comparison of these two forms and also of *lacinia* (Hübn.).

We are indebted to Mr. J. R. Haskin for the loan of a series of *californica* and *lacinia,* and to Dr. E. Giacomelli for a series of *saundersii* from Argentina. Mr. Wright's "Butterflies of the West Coast" and Dr. G. B. Longstaff's "Butterfly Hunting in Many Lands" furnished us with information as to habitat, and other data. In the ENTOMOLOGICAL NEWS, Volume 25, page 303, Mr. Haskin gives a description and account of *californica.*

Upper side, primaries: The marginal buff spots in *californica* are larger and more distinct than in *saundersii;* in *lacinia* they are white and less distinct. In all, the fifth, sixth and seventh spots are always present and most distinct.

The buff median band in *californica* and *saundersii* is even in width across the wing; in *lacinia* it is narrower at the anterior part.

The fifth spot of the band in *californica* is generally small, in *lacinia* it is smaller, but in *saundersii* this spot is large and elongated outwardly to envelop the white spot of the submarginal row, and sometimes extends to the buff spot of the marginal row.

The three basal spots are very much larger in *saundersii* than in either of the others.

Secondaries: The marginal buff spots in *californica* are always large, in *saundersii* they are, in some, large and distinct and, in others, small and indistinct; in *lacinia* they are always very faint.

The buff median band in *californica* is similar to that of *lacinia;* in *saundersii* it generally extends to the basal angle, but sometimes it is stopped by a narrow black band, one-third the distance from base to margin.

In *californica* the basal area is brownish-black with one small buff spot in the cell; in *lacinia* there are two spots in the cell while in *saundersii* the spot is so large as to take the place of the brownish-black area almost entirely.

Under side, primaries: The marginal buff spots in *californica* and *lacinia* are always distinct; in *saundersii* they are small and faint.

In *californica* the white spots of the submarginal row are generally small; in *lacinia* they are twice the size and in *saundersii* they are of intermediate size.

The yellow median band is even in width across the wing in *californica* and *saundersii;* while in *lacinia* it tapers off toward the anterior part.

In *californica* the base is brownish-black, except the inner half of cell which is buff and a white spot in outer half of cell; in *lacinia* and *saundersii* this area is brownish-black with two buff spots in the cell and one between veins Cu2 and A.

Secondaries: On the outer edge of the yellow median band in *lacinia* and *saundersii* there are some spots partly detached by black marks, but in *californica* there are no such spots. The number and position of these spots vary greatly.

The base is brownish-black; in *lacinia* there is a row of four buff spots, and beyond this there is one spot in the cell and one between veins SC and R; in *saundersii* and *californica* there is no such spot between veins SC and R.

Habitats. californica: Goldroad, Ariz. (1), Colorado Desert (4);

lacinia: Georgetown, Texas (1), Southern Arizona (4);

saundersii: Caracas, Venezuela (2), San Juan, Trinidad (2), La Rioja, Argentina (3).*

References: (1) Mr. J. R. Haskin, (2) "Butterfly Hunting in Many Lands" by Dr. G. B. Longstaff, (3) series from Dr. E. Giacomelli, (4) "Butterflies of the West Coast" by W. G. Wright.

To our minds these three names represent geographical forms of one species found from Argentina to California. It is seen by our comparison that *saundersii* is closer to *californica* than it is to *lacinia*. To show our ideas more graphically we would suggest the arrangement of these forms as follows:

Synchloe lacinia lacinia Hübn.

Synchloe lacinia saundersii Doub.-Hew.

Synchloe lacinia californica Wright.

*According to the catalogues of Dyar and Strecker and an article in *Papilio* by Aaron, *saundersii* is found in the United States and the habitat is given by Aaron as Texas.

Three new Species of Coleoptera from North Carolina.

By A. H. MANEE, Southern Pines, North Carolina.

The following species of beetles were declared to be new by the late Frederick Blanchard after whom I have named the first. Types have been placed in the collection of the Academy of Natural Sciences of Philadelphia.

Selenophorus blanchardi n. sp.

Color dark brown with wings slightly metallic, scarcely lighter beneath, antennae light, paler towards base.

Head moderate with two long and four shorter bristles in front; eyes prominent with long bristle at base; antennae not reaching to base of thorax, a bristle at front of first segment.

Thorax as wide in front as at base, sides from rounded frontal corner rounding almost evenly to very near basic angle, edge with bristle at anterior two-fifths, median stria almost or quite obsolete, without punctures, basic depressions almost or quite obsolete but slightly rugose, edge depressed quite evenly except more widely near base.

Elytra from rounded shoulders very gradually widening to middle, thence rounding in and at apical sixth more abruptly with marginal depression at apical eighth, striae distinct but shallow with intervals smooth and flat, second inner stria with four punctures at regular intervals of .5 mm. and with a fifth puncture only .25 mm. from the fourth.

Legs: all tibiae strongly bristled, hind tibia longer than tarsus, first segment of hind tarsus as long as the remainder.

Length 5 mm., width 2.3 mm., length of elytra 3 mm.

From four specimens taken by the author at Southern Pines, North Carolina, about mid-April of 1912, 1913 and 1914.

Erchomus politus n. sp.

Color piceous. The microscopic uni-pilose punctures so widely separated by such smooth spaces as to allow the appearance of a polished surface, even the microscopically crinkled head also shining, midwings, edges, legs, antennae and mouth parts lighter.

Head not large, eyes with minute facets in relief; antennae very pilose, segments 3 to 10 gradually increasing, the eleventh diminishing to tip and as long as 9 and 10 combined, extending to basic third of thorax.

Thorax at sides with sutural edge rounding out to near base, thence parallel and as wide as elytra, at basic edge a slight spur conforms to rounded shoulder of elytra, from which the base runs very evenly in a semi-cylindrical arch scarcely flattened at top.

Elytra conforming to thoracic base, sides parallel, the tip practically parallel with frontal edge.

Abdominal segmental edges pilose, the last more strongly so or bristled, four segments protruding beyond elytra or sometimes drawn in telescopically, giving the appearance of being dropped or broken off.

Length 2 mm., width 1.2 mm., length to tip of elytra 1.6 mm.

Specimens abundant under bark of dead pines and deciduous trees and when exposed very lively to avoid the light.

Coenocara nigricornis n. sp.

♂. Antennae and palpi dark or fuscous, a peculiarity seen in no other species except the very unlike *scymnoides* Lec. Color piceous, not as dark as in *oculata*, which this species most closely resembles, the more profuse pilosity giving it a gray-brown aspect; finely and densely punctulated throughout, the punctures more widely separated than in *oculata;* head proportionately larger, but eyes as small and about equal in both sexes cleft about two-thirds (in *bicolor* Germ. the eyes are nearly black, the facets more in relief, the cleft only to middle and in the ♂ much larger than in the ♀). The elytral striae, two complete near margin and one short frontal just above, are as in *oculata*.

Length 2.6 mm., *oculata* and *bicolor* being about 2 mm.

Five specimens in all, three in possession of author and one ♂ one ♀ in the Blanchard addition of the LeConte collection at Cambridge, Mass.

The North American Species of Draeculacephala (Homoptera).

By E. P. Van Duzee, Berkeley, Calif.

A fine series of these insects from Georgia and Florida received from Prof. J. C. Bradley has enabled me to make out with some degree of certainty all the known forms except *producta* Walker, and to distinguish four still undescribed. In the following key the characters have been taken mostly from the females as they are usually more abundant

and show better diagnostic characters. In the males the vertex is uniformly shorter with the dark markings more pronounced.

KEY TO THE SPECIES:

Line of the face when viewed from the side rectilinear or nearly so 1

Line of the face strongly arcuated, the front tumidly convex.....12

1, Markings of vertex consisting of pale brown mottlings, arranged more or less distinctly in longitudinal series; color dull testaceous yellow, the broad anterior margin of pronotum and elytral venation whitish; vertex acute, nearly as long as broad; last ventral segment of female distinctly bisinuate; length 8-9 mm.; Florida .....*floridana* Ball.

Vertex not mottled; markings in lines and points more or less distinct 2

2, Five black points on the vertex (including the ocelli) and two on the base of the scutellum 3

Vertex and scutellum without distinct black points or the ocelli only marked with black 4

3, Color pale testaceous tinged with brownish, the costa only yellowish; anterior margin of pronotum with vermiculate marks including a distinct black spot behind the eye; vertex acute, as long as broad; last ventral segment of female produced, the lateral angles right-angled; length 6 mm.; Southern states, *7-guttata* Walk.

Color typical of the genus, yellow with the disk of the pronotum and the elytra green; anterior black point on the vertex often obsolete in the male, the lines obscure; vermiculate marks on the anterior margin of the pronotum faint or wanting, not forming a point behind the eye; vertex acute, not as long on the middle line as wide at base including the eyes; last ventral segment of the female scarcely bisinuate, the lateral angles sometimes moderately produced; length 6 mm.; Georgia..*balli* n. sp.

4, Vertex acute, much less than right-angled in the female; pronotum with a group of black punctures before the humeri 5

Vertex obtuse, scarcely more than right-angled before; pronotum without a group of black punctures before the humeri 9

5, Vertex greatly produced, at least as long as broad across the eyes; lines on vertex indistinct; green and yellow of the upper surface clear, elytral nervures bluish; beneath testaceous; female without fuscous vitta on the sides, its last ventral segment truncated and but little produced; length 9 mm.; Florida.*acuta* Walk.

Vertex not as long as wide across the eyes..... 6

6, Anterior margin of pronotum with vermiculate dark marks; lines on the vertex obviously interrupted or dotted; hind edge of vertex with a short oblique brown line behind each ocellus; beneath black or fuscous; face black in both sexes; last ventral segment of female nearly truncated, slightly produced at the middle; length 6 mm.; Georgia .....*bradleyi* n. sp.

Anterior margin of pronotum without vermiculate marks; oblique line wanting on hind margin of the vertex 7

7, Vertex equal in length to the pronotum; male black beneath; last ventral segment of female obviously bisinuated, the median tooth longer than the lateral angles; length 6 mm.; United States, *minor* Walk.

Vertex one-half longer than the pronotum; males rarely deep black beneath, at least on the face 8

8, Larger; markings on vertex more obsolete, often scarcely indicated; elytral venation pale, the pronotum without pale longitudinal lines; last ventral segment of the female more produced, the lateral angles obvious; length 9-10 mm.; U. S. and Canada to Rocky Mts. .....*angulifera* Walk.

Smaller, markings on vertex distinct; elytral venation more or less bluish; pronotum with three bluish longitudinal lines; last ventral segment of the female more truncated; length 7 mm.; United States .....*mollipes* Say.

9, Anterior margin of pronotum with vermiculate dark marks; vertex subacute before; scutellum with three points and a line black; colors dull; last ventral segment of the female truncated, a little roundedly produced at the middle; length 7 mm.; Georgia, *inscripta* n. sp.

Anterior margin of pronotum without vermiculate marks.....10

10, Male: head subacute, angle of the vertex distinctly less than a right-angle; markings of vertex heavy, including a sagittate mark before the apex and an annulus next the eye; form narrower; plates produced in long acute upturned points; length 7 mm.; Colorado to Canada .....*manitobiana* Ball.

Head more obtuse, apex of the vertex about a right-angle in the male, scarcely less in the female; markings of vertex lighter, with an incomplete annulus next the eye and no sagittate mark before the apex; form broader 11

11, Black marks at apex of the vertex narrower, linear and parallel in the female, broader and more diffuse in the male but not transverse or divergent behind; sides of the pronotum without a black line behind the eye; male antennæ long, thickened to near its tip; male plates with abrupt, slender and divergent tips; length 7-8 mm.; Washington and Oregon ....*crassicornis* n. sp.

Black marks at apex of vertex broad and subtriangular, transverse behind; sides of the pronotum with a slender black line behind the eye; male antennae normal, setaceous; plates of male with slender divergent tips; length 8 mm.; United States and Canada .....*noveboracensis* Fitch.

12, Vertex about as long as the pronotum; whitish with a short median line at base and a broad wedge-shaped vitta at apex, the latter mottled; scutellum with a transverse line and sometimes four points black; Colorado .....*gilletti* Ball.

Vertex much shorter than the pronotum, fulvous with a polished black dot on each ocellus; scutellum immaculate or with the incised line slenderly brown, South States to California..*reticulata* Sign.

DESCRIPTIONS OF NEW SPECIES:

Draeculacephala balli n. sp.

Allied to *7-guttata* Walker but differs in being smaller, green instead of testaceous brown, and in wanting the black points on the pronotum behind the eyes and the anterior point on the vertex is often wanting. Length 5-6 mm.

Vertex in the male as long as the pronotum, distinctly longer in the female; sides viewed from above rectilinear, not slightly concave as in *7-guttata*. Front viewed from the side nearly rectilinear, not obviously concave as in the female *7-guttata*. Last ventral segment of female moderately produced, the lateral angles sometimes a little prominent; male plates longer than the pygofers, acute and a little produced and recurved at apex, about as in *7-guttata*.

Color green, somewhat obscure; vertex, costa and anterior margin of pronotum obscure greenish or whitish yellow. Three points on the vertex and an angular mark at the apex black; the two posterior points are more conspicuous and are placed on the hind margin behind the ocelli. Pale anterior margin of the pronotum sometimes with faint green mottlings. Scutellum with two conspicuous black points within the basal angles. Beneath and legs pale brownish testaceous; front darker with a black point at apex and another in the antennal cavity, and about seven darker arcs; sides with a blackish vitta under the eye extended over the pleuræ, sometimes diffuse; tergum blackish, darker in the male.

Described from numerous examples of both sexes taken on Billy's Island in the Okefenokee Swamp, Georgia, in June, and in Decatur County, Georgia, in July, by Prof. J. C. Bradley. This is evidently the form described by Dr. Ball as *7-guttata* in his Review of the Tettigonidæ. His specimens were from Florida and Mississippi.

Draeculacephala bradleyi n. sp.

Allied to *balli* but averaging smaller. Length 5-6 mm.

Vertex long; of the female one-fourth longer than the pronotum, of the male scarcely longer; sides rectilinear. Front viewed from the side very feebly concavely arcuated. Clypeus quite strongly angled. Last ventral segment of female short-triangular at apex, the sides nearly straight; plates of the male longer than the pygofers, acute but not produced at apex.

Color a rather dull dark green, nervures paler; vertex, broad anterior margin of pronotum, scutellum and costa yellow, more or less tinged with green. Lineations of the vertex obscure, especially in the female; hind margin with a short oblique line behind each ocellus; ocelli black; extreme tip of vertex fulvous with a minute brown dash on either side. Pale anterior margin of pronotum with dusky lines and points, more conspicuous in the male. Beneath nearly black, deeper on the face, where the frontal arcs are often obsolete; edge of the head clear yellow. Venter sometimes greenish, the edge of the connexivum pale.

Described from one female and many males taken on Billy's Island, Okefenokee Swamp, Georgia, in June, and in Decatur County, Georgia, in July, by Prof. J. C. Bradley, to whom this species is dedicated in recognition of his able assistance in the collection and study of the Hemiptera. I have tried to identify this species with *producta* Walker, but I find too many discrepancies to allow of such determination.

Draeculacephala inscripta n. sp.

Allied most closely to *minor*, but more stoutly built, with the vertex and anterior margin of the pronotum heavily lined with black. Length 7 mm.

Vertex acute at apex, a little shorter than the pronotum, its length nearly one-half its width across the eyes; the surface behind the apex not so strongly depressed as in some of the allied forms; clypeus unusually tumid and strongly angled when viewed from the side. Last ventral segment of the female roundedly produced at the middle, this lobe shorter and less angled than in the allied species.

Color dark dull green above with the vertex, anterior margin of the pronotum, scutellum and costa dull yellowish. Markings of the vertex heavier than in any allied species, more typical of the *noveboracensis* group; these marks consist of four arcs on the reflexed base of the front, which unite to form an oblique black ray either side of the apex;

a curved line behind these which is angled where it touches the apical margin before the ocellus and is continued to the eye as a marginal line, a more strongly curved line on the disk behind this terminating behind the ocellus and near a vertical line which with the marginal line and one next the eye nearly encircles a black dot; median line slender, black. Pale anterior margin of the pronotum with vermiculate dark marks. Scutellum with the anterior margin, in part beneath the pronotum, the transverse incised line and three points before it black. Elytral venation pale. Beneath pale, face darker, with about 10 brown arcs. A lateral line cutting the eye deep black; apex of the head black bisected by a yellow line.

Described from a single female taken in the Okefenokee Swamp, Georgia, in June, by Prof. J. C. Bradley.

Draeculacephala crassicornis n. sp.

Allied to *noveboracensis*, but with the vertex a little longer in the female and more heavily lineated with black; male antennae stout, setaceous only at tip. Length 7-8 mm.

Vertex about right-angled in the male, a little longer in the female. Lineations of the vertex slender but distinct; black marks at apex of the vertex parallel, not at all triangular in the male, in the female linear, in both sexes leaving a conspicuous yellow median vitta. Plates of the male abruptly narrowed to long, slender points as in *manitobiana*, but here they are strongly divergent, almost at a right angle, not upturned as in the other species. Antennae of the male long and conspicuously thickened nearly to the apex and a little flattened, the middle of the thicker portion a little more slender. Last ventral segment of the female less produced than in *noveboracensis*, with the lateral angles more retreating.

Colors duller than in *noveboracensis*, the apex of the pronotum and base of the vertex sometimes touched with green; sides of pronotum without a black longitudinal line. Elytral venation more or less bluish. Antennæ testaceous, becoming black on the apical one-half of the thickened portion, with its apical seta white.

Described from two males and one female collected at Rock Creek, Oregon, July 14th, and two females from Corvallis, Oregon, all received from Dr. H. F. Wilson, and one female in my own collection taken by Mr. T. Kincaid at Olympia, Washington. Should these sexes be incorrectly placed the name must follow the male. The unusually thickened antennæ of the male will distinguish the species.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., APRIL, 1915.

The Intensive Study of Species.

The differentiation of species or of larger taxonomic groups on the basis of the differences shown by a single structural feature, a single organ or a single system of organs, is a familiar feature in the history of biological classification. As a student of the late Prof. E. D. Cope, we recall a remark made by him to the effect that eventually each group would probably be defined by a single character only. At nearly the same time, Dr. George H. Horn would express his belief that the study of a hitherto unregarded organ in any series of living things would ultimately improve and correct the taxonomy of that same series as previously established on other characters.

Recent tendencies seem to incline to Horn's view rather than to Cope's. Prof. Castle has expressed these tendencies thus:

> If we compare one wild species with another, we commonly find existing between them not single striking differences but numberless minute differences.....if one makes an intensive study of related species, he finds that they differ in endless details of structure and physiological behavior extending even to differences in size of the constituent cells of the body (Conklin), or of their parts (chromosomes, chromomeres, etc.). (*Science*, Jan. 15, 1915, p. 96.)

Prof. McClung tells us of having corrected a false label on a microscopic slide of sections of a grasshopper's testis by recognizing the differences in the chromosomes of the species really present and of that which it purported to be.

In a recent obituary of Prof. C. S. Minot we have quoted his conclusion "even a piece of cuticle suffices for the identification of the species" of a Lepidopterous larva.

The minuter differences, the finer discriminations, these are the signs of the times in taxonomy and Prof. Castle, in the article from which our quotation is made, shows in a most interesting way how these small differences are related to the possibilities in evolution.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Photographs received for the Album of the American Entomological Society.

During the year 1914 photographs for the album were received from the following persons, and the members of the Society wish again to thank the donors for their much appreciated gifts: E. D. Ball, E. W. Beyer, J. C. Crawford, N. Criddle, L. G. Esson, C. T. Greene, W. D. Kearfott, W. W. Newcomb, A. F. Porter, S. A. Rohwer, Mrs. P. R. Uhler, A. C. Watson, J. B. Watson, T. N. Willing.

The Occurrence of Pediculopsis graminum Reuter and the Carnation Bud-Rot in New Jersey (Acar.)

During the fall of 1914 carnation buds in several greenhouses in northern New Jersey were observed to be deformed and somewhat lop-sided. Upon cutting them open the interior was found to be decayed and contained as a rule one or more female mites with greatly distended bodies. White varieties of carnations seemed to suffer the most. According to Stewart and Hodgkiss, the rot is caused by a species of fungus (*Sporotrichum poae*) which also causes the silver top of June grass and the mite has been found accompanying the disease in both cases. It appears that the mites bearing the disease spores are carried into the house in summer in the soil and enter the immature flower buds as soon as they appear. The spores therefore find a favorable place in which to develop and decay finally sets in. Treatment consists in promptly picking and burning all infested buds. Accounts of this trouble can be found in Tech. Bull. No. 7, N. Y. Agric. Exp. Sta., Bull. No. 103, Neb. Agric. Exp. Sta., and the 27th Report of State Entomologist of Illinois.—HARRY B. WEISS, New Brunswick, N. J.

An Insect's Femur as a Fish Hook (Orth.).

A curious use is made of the spine on the hind femur of the Phasmid, *Eurycantha latro*, by the natives in the hill-villages of northern Goodenough Islands, near New Guinea. The femur is strung on the end of a fishing line, so that the recurved spine will act as a fish-hook barb. [See H. Balfour's article and illustration in *Man*, Feb., 1915.]

Proposed Entomological Work in Porto Rico.

Professor John H. Gerould, of Dartmouth College, Hanover, New Hampshire, expects to go to Porto Rico with Dr. A. G. Mayer's party on May 15, returning to New York, June 21, to study the Lepidoptera and other insects of the island with a view to undertaking breeding experiments upon stock from the tropics.

Linguatula serrata (larva) in a Native Central American. (Arachnida).

Two cases of infection by linguatulids have been observed at Ancon Hospital during the past six years and while the condition is not uncommonly met with at autopsy in Europe, and while infections by other representatives of the Linguatulidae—*Porocephalus armillatus* and *moniliformis*, have been reported from Africa and Asia, the literature appears to afford no example of an infection by *Linguatula* in a native of America.

In the case reported here a post-mortem examination was being held on the body of Leonidas, T., aged 32, a native of Nicaragua. He had been in Guatemala fourteen months ago, where he lost an arm during one of the revolutions there. It can not be ascertained with accuracy how long he had been in the Canal Zone, for he was not an employee. He entered the hospital at Paraiso and had evidently been on the trails for a couple of days (Dr. Preston). The patient was transferred to Ancon Hospital, August 29, 1911, and died September 15, 1911. During the autopsy, immediately after the lungs had been removed and excised, a larva was found crawling over the cut surface and along the pleura. As this was the only larva found, its exact location during the life of the patient is not known. The larva, no doubt, while parasitic, was harmless, and played no part whatever in the cause of death, which was cirrhosis of the liver.

The larva was active and crawled about very much like a fly larva. Its activity was retained after being five to six hours in a saline solution under a cover slip. Its color was white, becoming grayish and translucent when mounted temporarily under a cover slip with saline solution. Its body was 6.5 mm. long; its greatest width 1.52 mm.; it was flattened and tapered to an obtuse point posteriorly. It was encircled transversely by alternate rows of pores and retrorse, colorless, chitinous spines.—[Further description is given.]

In 1905, one of us (S. T. D.) saw a larva very much like the one just described. The specimen was seen in a film preparation from a stool. It is believed the patient was a white man, either a native of or long resident in Central America.—Dr. S. T. Darling and Dr. H. C. Clark in Proceedings of the Canal Zone Medical Association, Vol. IV, pt. II, pp. 11-14. Date of publication not given.

Identification of Specimens.

The following desire to be added to the list of those willing to determine material from North America in their respective groups. (See this volume of the News, pages 33, 35, 85 and 133 for further information and for directions for sending specimens.)

Coleoptera.—*Cerambycidae*: W. S. Fisher, 1337 Parkwood Place, N. W., Washington, D. C.; *Certain families*: C. A. Frost, 26 Pond Street, Framingham, Mass.

Data Wanted on Migrations of the Cotton Worm Moth (Lep.).

Prof. John H. Gerould, Dartmouth College, Hanover, New Hampshire, desires data bearing on the appearance of swarms of *Alabama argillacea* in the Northern States. He has recently reported such a phenomenon which occurred at Hanover on October 12, 1912, and correlated it with records of this species at other localities, and with prevailing weather conditions, in an article to appear in *Science*.

A mite parasitic on the Musk Rat. (Arachnida, Acarina).

Last year Messrs. M. Printz and L. I. Miller found specimens of a remarkable mite on a musk rat (*Fiber zibethicus cinnamominus* Hollister) on the Brighton road in Adams County, Colorado. I determined it as *Laelaps multispinosus* Banks, and this identification was later confirmed by Mr. Banks. The species was described from Canada, and is new to the United States.—T. D. A. COCKERELL, Boulder, Colorado.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded. The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of systematic papers are all grouped at the end of each Order of which they treat, and are separated from the rest by a dash.

Unless mentioned in the title, the number of new species or forms are given at end of title, within brackets.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London.

For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

3—The American Naturalist. **4**—The Canadian Entomologist. **6**—Journal of the New York Entomological Society. **9**—The Entomologist, London. **11**—Annals and Magazine of Natural History, London. **45**—Deutsche Entomologische Zeitschrift. **50**—Proceedings, U. S. National Museum. **59**—Sitzungsberichte, Gesellschaft der naturforschenden Freunde, Berlin. **68**—Science, New York. **79**—La Nature, Paris. **92**—Zeitschrift fur wissenschaftliche Insektenbiologie. **123**—Bulletin of the Wisconsin Natural History Society, Milwaukee. **161**—Proceedings, Biological Society of Washington. **184**—Journal of Experimental Zoology, Philadelphia. **211**—Popular Science Monthly, Lancaster, Pa. **239**—Annales, Biologie Lacustre, Brussels. **279**—Jenaische Zeitschrift fur Naturwissenschaft. **284**—Bulletin, Museum National d'Histoire Naturelle, Reunion Mensuelle des Naturalistes du Museum, Paris. **344**—U. S. Department of Agriculture, Washington, D. C. **399**—Proceedings of the Cambridge Philosophical Society, Cambridge, England. **447**—Jour-

nal of Agricultural Research, Washington. **480**—The Annals of Applied Biology. **499**—Transactions, Wisconsin Academy of Sciences, Arts and Letters, Madison. **500**—Bulletin Trimestriel, Societe d'Histoire Naturelle . . . de Toulouse. **501**—Rivista Coleotterologica Italiana.

GENERAL SUBJECT. Brunner v. Wattenwyl.—Obituary notice, **45**, 1914, 570. **Gilles & St. John**—Use of formalin in setting insects, **9**, 1915, 41-2. **Grossbeck, J. A.**—John Arthur Grossbeck, with a bibliography of his published writings, by W. T. Davis, **6**, xxii, 271-75. **Howard, L. O.**—Report of the entomologist, **344**, Rept. of Secretary, 1914, 183-98. **Kellogg, V. L.**—Insects of the Pacific, **211**, lxxxvi, 265-9. **Thompson, W. R.**—The cuticula of insects as a means of defence against parasites, **399**, xviii, 51-5.

PHYSIOLOGY AND EMBRYOLOGY. Castle, W. E.—Selection, sugar-beets and thrips, **3**, xlix, 121-2. **Hoge, M. A.**—The influence of temperature on the development of a mendelian character, **184**, xviii, 241-98. **Liff, J.**—Data on a peculiar mendelian ratio in Drosophila ampelophila, **3**, xlix, 97-120. **Newell, W.**—Inheritance in the honey bee, **68**, xli, 218-19. **Zeleny & Faust**—Size dimorphism in the spermatozoa from single testes, **184**, xviii, 187-240.

MEDICAL. Howard, L. O.—Dr. A. F. A. King on mosquitoes and malaria, **68**, xli, 312-15.

ARACHNIDA, ETC.

Caesar, L.—An imported red spider attacking fruit trees, **4**, 1915, 57-8. **Petrunkevitch, A.**—Attidae of the Yale Dominica expedition, **6**, xxii, 329-31.

NEUROPTERA, ETC. Awati, P. R.—The apple sucker, with notes on the pear sucker, **480**, i, 247-72. **Boyer, M. A.**—La mue chez un Thysanoure du genre Machilis, **500**, xlvi, 92-8. **Cummings, B. F.**—Note on the mouth-parts of a species of Polyplax (Anoplura) and on the relationship between Anoplura and Mallophaga, **11**, xv, 256-9. **Heiner, H.**—Zur biologie und anatomie von Cloëon dipterum, Baetis binoculatus und Habrophlebia fusca, **279**, liii, 289-340. **Marshall, W. S.**—On the anatomy of the dragonfly, Libellula quadrimaculata, **499**, xvii, 755-90.

HEMIPTERA. Hargreaves, E.—The life-history and habits of the greenhouse white fly (Aleyrodes vaporariorum), **480**, i, 303-34. **Williams, C. B.**—The pea thrips (Kakothrips robustus), **480**, i, 222-46.

Funkhouser, W. D.—Report on a collection of Membracidae from the Colombian Andes, taken by J. T. Lloyd, **6**, xxii, 275-81. **Jacobi, A.**—Bemerkungen ueber Jassinae (Homoptera Cicadoidea), **59**, 1914, 379-83. **Patch, E. M.**—Two clover aphids, **447**, iii, 431-33.

LEPIDOPTERA. Davis, W. T.—Some additions to the New Jersey list of L., **6,** xxii, 332-3. **Swett, L. W.**—Geometrid notes—Description of a new variety [of Hydriomena speciosata], **4,** 1915, 64.

DIPTERA. Scott & Lamb—The early stages of Paltostoma schineri, with a description of the female, **11,** xv, 181-202.

Alexander, C. P.—Description of new sps. of crane-flies from Central America, **50,** xlviii, 441-4. **Brues, C. T.**—A synonymic catalogue of the dipterous family Phoridae, **123,** xii, 85-152. **Johnson, C. W.**—A n. sp. of the genus Nephrocerus [N. slossonae], **4,** 1915, 54-6. **Malloch, J. R.**—Synopsis of N. American species of the genus Bezzia (Chironomidae) [3 new], **6,** xxii, 281-5. **Townsend, C. H. T.**—Proposal of new muscoid genera for old species [60 new names], **161,** xxviii, 19-24.

COLEOPTERA. Barber, H. S.—The breeding place of Dermestes elongatus, **161,** xxvii, 145-46. **Brocher, F.**—Recherches sur la respiration des insectes aquatiques adultes. Les Dyticides (second article), **239,** vii, 5-39. **Della Beffa, G.**—Anomalie cromatische osservate nello studio dei Coccinellidi, **501,** xii, 139-48. **Leuderwaldt, H.**—Zur lebensweise brasilianischer Cicindeliden, **92,** xi, 25-7. **Stellwaag, F.**—Die alula der kaefer, **45,** 1914, 419-34.

Grouvelle, M. A.—Mission geodesique de l'Equateur. Insectes recueillis par M. le Dr. Rivet. Coleopteres clavicornes, **284,** 1914, 43-56. **Kerremans, Ch.**—Note sur divers C. Buprestides des collections du Museum d'Histoire Naturelle de Paris; Collections recueillies . . . dans la Republique Argentine, C. Buprestides, **284,** 1913, 575-80; 580-89. **Leng, C. W.**—A n. sp. of Arthromacra with notes on other species of Lagriidae; Balaninus quercus Horn, **6,** xxii, 285-90; 332. **Olivier, M. E.**—Collections recueillies par M. E. R. Wagner dans la Republique Argentine, C. Lampyrides, **284,** 1913, 573-5. **Pierce, W. D.**—Descriptions of some weevils reared from cotton in Peru, **344,** Secr. Rept. No. 102. **Schaeffer, C.**—A short review of the No. American species of Onthophagus [1 new], **6,** xxii, 290-300.

HYMENOPTERA. Boenner, W.—Der temporare soziale hyperparasitismus von Lasius fuliginosus und seine beziehungen zu Claviger longicornis, **92,** xi, 14-20. **Coupin, H.**—La guerre chez les fourmis, **79,** 1915, 62-4.

Banks, N.—New sps. of Psammocharidae [13 new], **6,** xxii, 300-6. **Cockerell, T. D. A.**—Bees from Ecuador and Peru, **6,** xxii, 306-28. **Forel, A.**—Einige amerikanische Ameisen [5 new], **45,** 1914, 615-20.

Rohwer, S. A.—Synopsis of the species of sawflies belonging to the genus Dimorphopteryx [3 new], **50,** xlviii, 445-8. **Schrottky, C.**—Beschreibung einer neuen Crabronide aus Paraguay; Einige neue bienen aus Sud-Amerika, **45,** 1914, 624-5; 625-30.

Doings of Societies.

FELDMAN COLLECTING SOCIAL.

Meeting of November 18th, 1914, at the home of H. W. Wenzel, 5614 Stewart St., Philadelphia. Eleven members were present. Pres. H. A. Wenzel in the chair.

Lepidoptera. Mr. Daecke exhibited ten specimens of *Erannis tiliaria* Harr. from Harrisburg, Pennsylvania, October 23, 24 and 26, 1914, showing great individual variation. Stated that in the minutes printed in ENT. NEWS xxv, p. 431, 1914, "Force Mt." should be "Fourth Mt."

Coleoptera. Mr. H. W. Wenzel exhibited specimens of Ambrosia Beetles, *Xyleborus celsus* Eich. from Upper Darby, Pa., October 24, 1914. Said they were deep boring Scolytids and very hard to get, the specimens shown having been chopped from dead hickory six or seven inches below the surface of the wood by H. A. Wenzel and Mr. Kaeber.

Diptera.—Mr. Harbeck exhibited a pair each of the four species of *Proctacanthus* recorded from New Jersey, viz.: *philadelphicus* Macq., *nigriventris* Macq., *brevipennis* Wied. and *rufus* Will. and called attention to the difference between *philadelphicus* and *nigriventris* which were confused in collections under the name of the former until Prof. Hine separated them after examining New Jersey specimens sent him by Mr. Harbeck.

Adjourned to the annex.

Meeting of December 16th, 1914, at the same place. Eleven members were present; Pres. H. A. Wenzel in the chair.

Dr. Skinner stated that during the recent storms the ice was an inch thick on the trees about his home in Ardmore, many limbs being broken off by its weight which he thinks will have great effect on insect life.

Lepidoptera. Mr. Daecke exhibited the workings of the

larvae of *Sthenopis argenteomaculata* Harr. in alder from Harrisburg, Pennsylvania, but instead of breeding the moth he had gotten a Sarcophagid (Dip.) parasite June 10, 1914, and wondered how the fly deposited its eggs upon the moth larvae. Dr. Skinner said one peculiarity of this moth was that though it was nocturnal it is never attracted to light. Mr. Laurent said he had caught one by sugaring.

Diptera. Mr. Daecke also said he had found scale insects infested with a Lepidopterous larva which he had placed in a case by itself and was surprised to breed a fly: *Drosophila repleta* Woll. Mr. Harbeck exhibited a dozen species of *Exoprosopa* and *Anthrax* collected by Mr. Woodgate in Jemez Mts., New Mexico.

Coleoptera. Mr. H. W. Wenzel said that since the end of October, 1914, H. A. Wenzel and he have collected more specimens and species of Cioidae than all the collections in Philadelphia contain together. These were exhibited. Dr. Castle said he had been working on the Staphylinidae and had collected at Morton, Pennsylvania, June 15, several specimens of *Oxyporus 5-maculatus* LeC. which he said is closely allied to the Canadian species *O. occipitalis* Fauv.

Hymenoptera. Mr. H. A. Wenzel exhibited five nests of the Potter Wasp, *Eumenes fraternus* Say, found at Naylor's Run, Delaware Co., Pennsylvania, July 12 on young hickory. These bred from August 4 to 11 except one from which a Dipterous parasite emerged July 30.

Adjourned to the annex.

Meeting of January 20th, 1915, at the same place. Eleven members were present. Messrs. Rohwer, Crawford and Cushman, of Washington, D. C., visitors. Pres. H. A. Wenzel in the chair.

The President read his annual address which was ordered to be incorporated in the minutes.

The present officers were re-elected to serve for 1915 and are as follows: *President,* H. A. Wenzel; *Vice-President,* W. S. Huntington; *Treasurer,* H. W. Wenzel; *Secretary,* George M. Greene, and *Assistant Secretary,* J. W. Green.

Hymenoptera. General discussion on *Vespula* and their nests. Mr. Daecke said he had seen a nest of *maculata* in the mountains near Harrisburg, Pennsylvania, that, instead of being suspended from a limb, was built against the trunk of a tree (about two feet in diameter) four feet above the ground.

Diptera. Mr. George M. Greene exhibited a specimen of *Callicera johnsoni* Hunter which he collected in Fairmount Park, Phila., and said he understood it was the seventh specimen recorded. The type was taken in Fairmount Park by Charles T. Greene, May 7, 1895, resting on the ground on the east side of the Schuylkill River. The specimen shown was collected May 7, 1914, resting on a tree on the west side of the river, directly opposite where the type was taken.

Hemiptera.—Mr. Laurent exhibited his collection of Cicadidæ in which all the species known to occur in New Jersey and Pennsylvania with the exception of one were represented. He stated that the reason the males outnumber the females in collections was owing to the fact that the males alone produce the call or song, thus enabling the collector to locate them.

Adjourned to the annex.—GEORGE M. GREENE, *Secretary.*

THE ENTOMOLOGICAL SOCIETY OF FRANCE AND THE WAR.

At the meeting of October 14, 1914, the President, M. Ch. Alluaud, said: "My dear Colleagues, Since our last reunion [July 22] the greatest armed conflict that history has yet recorded has broken out, the greatest peril that our country has ever run has menaced us. I ask you, since our ancestors of 1870-71 have set us a good example, not to interrupt the course of our meetings under any pretext and to come in as great numbers as possible on the stated days. Your officers make every effort to assure the publication and distribution of the *Bulletin*....and count, as usual, on your observations and your work. In reading the minutes of our meetings of the winter of 1870-71, I met this passage in the address of Dr. Laboulbène (meeting of Jan. 11, 1871) and I ask your permission to reproduce it literally: 'Our session to-day will perhaps be troubled by the explosion of hostile projectiles, some of which have fallen some paces from this house....' You will agree, gentlemen, that it is a case of repetition, that history

is an eternal recommencement. In place of a siege we have the 'tauben'—sinister passenger pigeons—one of which dropped a bomb, the day before yesterday, in the Rue Guy-de-Labrosse, very near the Museum of Natural History."

The following members of the Society are serving in the Army: Dr. R. Jeannel, secretary; Dr. Maurice Royer, first assistant secretary; J. Sainte-Claire Deville, *L. Semichon, J. Surcouf, J. Achard, A. Magdelaine, Joseph de Muizon, Georges Koechlin,* Dr. Maurice Bedel, G. Billiard, V. Laboissière, A. Mequignon, Dr. L. Bettinger (whose collection was destroyed in the bombardment of Rheims), L. Beguin. G. Babault (recently returned from an expedition in the Himalayas), P. Chabanaud, A. Lavallée, L. Legras, P. Vayssière, J. Vincent, *J. Aubail,* J. Hervé-Bazin, E. Roubaud and E. Dattin. [Those whose names appear in italics have been wounded in action. Elsewhere in this NEWS the names of those killed in battle are given.]

At the end of the meeting of Nov. 11, 1914, "M. A. Bourgoin, considering that the closing of the cafés at 8 o'clock deprives us of the traditional 'humid session,' proposed to contribute to the 'soldiers' tobacco fund,' the savings to be realized from this fact. This generous thought of our Archivist-Librarian was adopted and the collection produced a sum which will procure for thirty-two of our brave soldiers in the bottom of their trenches the joy of receiving each a package of 'caporal.'"

At the meeting of July 22 the Passet Prize was unanimously voted to P. de Peyerimhoff for his memoirs on the larvae of Coleoptera. (*Bulletin,* 1914, Nos. 14-17).

OBITUARY.

[From recent numbers of the *Bulletin* of the Entomological Society of France for 1914, we learn of the death of the following entomologists.]

HENRI ACHARD DE BONVOULOIR died at Paris, July 13, 1914, at the age of 75 years. Undertaking the study of the Coleoptera when a young man, under the direction of C. Jaquelin Duval, he first turned his attention to the Throscidae, of which he produced a monograph in 1859. After some additional papers on this group in 1860 and 1862, he turned his attention to the Eucnemidae. His monograph of this family was published by the French Society in four parts from 1871 to 1875 and amounts to 908 pages and 42 plates. He became

a member of the Society March 9, 1859, and served as its Archivist and Librarian. A bibliography of his entomological writings (10 titles) is given in the *Bulletin* cited, No. 14.

JEAN PEREZ, known for his work on bees, died at St. Georges de Didonne, Charente Inferieure, in the beginning of September, 1914. He was professor in the faculty of Sciences of Bordeaux.

PIERRE EMILE GOUNELLE died at Paris, October 2, 1914, aged 64 years. Beginning in 1884, he made a number of entomological explorations in Brazil, and he has left to the Museum of Paris a very fine collection particularly rich in South American Cerambycidae and in examples of mimicry. His numerous writings relate chiefly to Brazilian Cerambycidae. He bequeathed 10,000 francs, his entomological and other scientific books and his collection of humming-birds to the Entomological Society of France, with permission to sell the collection and such of his books that the Society does not wish to retain. Bibliographies of MM. Perez and Gounelle are promised in future numbers of the *Annales* of the Society. (*Bulletin* cited, nos. 15, 16).

LEON VIBERT, lieutenant colonel in the geographical service of the French army died at Paris, August 24, 1914, at the age of 51 years. In the course of his topographical work in Algeria and southeastern Tunisia he contributed to knowledge of the entomological fauna of North Africa (*L. c.* No. 15).

ALBERT CHEUX, a life member of the Society who died at La Baumette, near Angers, July 5, 1914, bequeathed to the Society his collection of Lepidoptera and his entomological library. (No. 17).

The following members of the Society have fallen in the present war: RAYMOND MORGON, ANDRE VUILLET (at Ippecourt, Sept. 10), LEON GARRETA and JEAN CHATANAY.

EXCHANGES.

Not Exceeding Three Lines Free to Subscribers.

☞ **These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued**

Ipidae (Scolytidae)—Will exchange for eastern, northern or southern species the Pacific Coast species *Dendroctonus brevicornis, monticolae, jeffreyi, valens, Ips confusus, oregoni, emarginatus, concinnus, latidens, Pityogenes carinulatus, Phloeosinus punctatus, cupressi, Hylurgops subcostulatus*, etc.—Ralph Hopping, 114 Sansome St., San Francisco, Cal.

I have eggs of Nebraska *Catocala*, perfect specimens of Missouri *Catocala*, Nebraska and Facific Coast Lepidoptera and botanical specimens for exchange for certain rare U. S. Lepidoptera.—E. A. Dodge, 546 Bay St., Santa Cruz, Calif.

Diptera—Unnamed material wanted. Will collect other orders in exchange.—C. F. Adams, Atherton, Mo.

For Exchange—Illinois and Indiana Coleoptera, mostly Cicindelidae, Carabidae, Buprestidae, Cerambycidae and others, for North American species new to my collection.—C. Selinger, 1338 South 50th Avenue, Cicero, Ill.

Diptera—Wanted for cash or to borrow for study only, North American Leptidae (incl. *Coenomyidae* and *Xylophagidae*).—M. D. Leonard, Cornell University, Ithaca, N. Y.

Costa Rica—Any one interested in entomological material from Costa Rica should communicate with me at once. I expect to spend three months there this summer.—D. E. Harrower, Swarthmore, Pa.

Wanted—50 *V. huntera*, 100 *H. unipuncta*, 25 *A. argillacea, Arg. diana* 2 pair, *L. eros, L. hulstii, M. eurydice* males only, *M. yuccae, T. gundlachianus, T. proterpia, T. nicippe, L. sononensis, T. chrysalus, L. ursula* 6 of each = 3 pair, 8 of any *Chrysophanus*.—A. F. Porter, Decorah, Iowa.

For Exchange—Catocala from this locality for *Catocala* and other Lepidoptera not in my collection; also fertile ova of *Catocala amatrix* and *nurus*.—Mrs. O. F. Hiser, Nevada, Iowa.

Specimens collected—Will collect Diptera, Hymenoptera, Ichneumonidae, Odonata, Hemiptera-Homoptera, Coleoptera or Lepidoptera during the coming season. Let me know your desiderata now.—Harry L. Johnson, So. Meriden, Ct.

I will name specimens of Coleoptera in certain families. Correspondence with beginners desired. No specimens will be retained without permission of the owner.—C. A. Frost, 26 Pond St., Framingham, Mass.

Wanted Transactions American Entomological Society, Vol. IV; Entomological News, Vol. II, Nos. 6 and 10, or Volume.—Howard L. Clark, Hotel Puritan, Commonwealth Ave., Boston, Mass.

I have a number of duplicates of entomological Exp. Station Bulletins, Entomologist's Reports, Bureau Bulletins and Circulars, etc., for exchange or sale.—Geo. G. Ainslie, 227 Peachtree St., Nashville, Tenn.

Will exchange eggs of *Hemileuca maia* for native or exotic Lepidoptera and Coleoptera and Cicindelidae. Send your lists.—Adolph Mares, 2524 So. Homan Ave., Chicago, Ill.

For Exchange—*Catocala tilania* Dodge for other species of same genus not in my collection. Send list and name terms to Ernst Schwarz, 6310 N. Newstead Ave., St. Louis, Mo.

Photographs of Entomologists Desired.

The Entomological Section of the Philadelphia Academy of Natural Sciences desires for its entomological album the photograph of every entomological student. The collection contains over 300 at this date. A list was published in the NEWS 1902, pages 45-47, of those in the album at that time. We hope that those who can do so will write their names and date of birth and the date when the photograph was taken on the back of each photo, along with any other information concerning themselves they may wish to impart.

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ENTOMOLOGICAL LITERATURE.

FOR SALE.

691.—**Alexander** (C. P.)—On a Collection of Crane-Flies from British Guiana (Tipulidae). **(40,** 223-255, 2 pls., '14).. .45

692.—**Wickham** (H. F.).—Twenty new Coleoptera from the Florissant Shales. **(40,** 257-270, 4 pls., '14)..... .25

693.—**Rehn & Hebard.**—Studies in American Tettigoniidae. I. A Synopsis of the species of the genus Scudderia. II. A Synopsis of the species of the genus Amblycorypha found north of Mexico. **(40,** 271-344, 4 pls., '14)..... 1.10

694.—**Dietz** (W. G.).—The Hebes group of the Dipterous genus Tipula. **(40,** 345-363, 2 pls., '14)..... .30

695.—**Rehn & Hebard.**—Studies in American Tettigoniidae. III. A Synopsis of the species of the genus Neoconocephalus found north of Mexico. **(40,** 365-413, 2 pls., '14) ..... .75

696.—**Schaus** (W.).—New species of Heterocera from Tropical America. **(41,** 1-9, '15)..... .15

697.—**Ramsden** (C T.).—A new Pieris from Cuba. (Ent. News, **26,** 15-16, '15)..... .05

698.—**Van Duzee** (M. C.).—Descriptions of three new species of the Dipterous genus Sciapus with a key to the North American species. (Ent. News, **26,** 17-26, figs., '15)... .15

699.—**Cockerell** (T. D. A.).—The real Trigona dorsalis Smith rediscovered. (Ent. News, **26,** 30-32, '15)..... .05

700.—**Cresson** (E. T., Jr.).—Hints on packing insects for transportation. (Ent. News, **26,** 33, '15)..... .05

701.—**Watson** (J. R.).—New Thysanoptera from Florida. (Ent. News, **26,** 49-52, 1 pl., '15)..... .15

702.—**Cresson** (E. T., Jr.).—Descriptions of new genera and species of the Dipterous family Ephydridae. II. (Ent. News, **26,** 68-72, '15)..... .10

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